10 GREAT PROGRAMS IN THIS ISSUE!

Disk Package—Power-Packed Utility for the 64

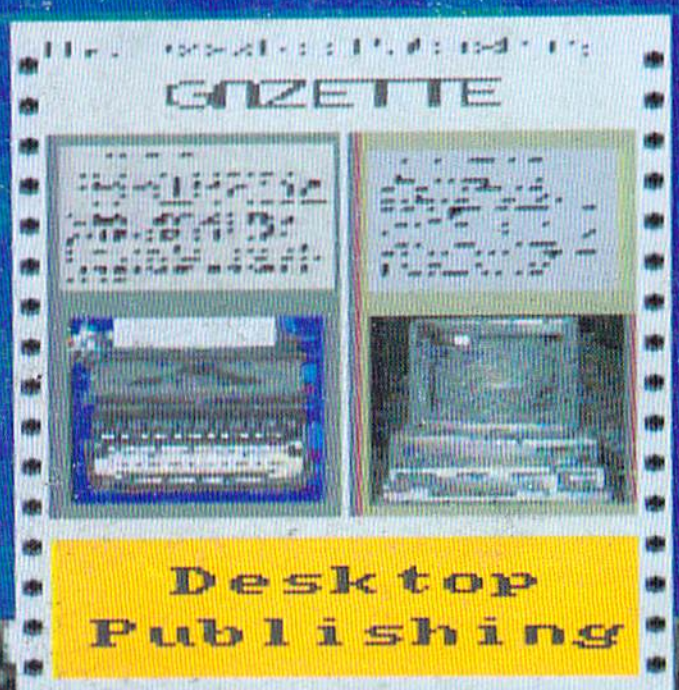
COMPUTE!'s GAZETTE

September 1988

FOR **COMMODORE** PERSONAL COMPUTER USERS

Extra! Extra! Write All About It!

Pro-quality desktop publishing is here for your 64 and 128



PLUS

3 Super Arcade-Style Games

Lincoln Green: New Perils in Sherwood Forest

Boom and Bust: Word Madness

Lava Flow: A Bricklayer's Nightmare

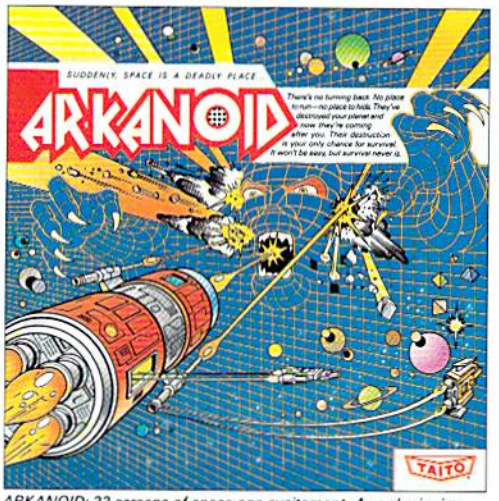
SpeedCheck 128
Fast, easy-to-use spelling checker for *SpeedScript 128*

02220
USA $2.95
Canada $3.50
09
0 71486 02220 6

WHAT'S A TAITO®?

That's a very good question. Taito (pronounced Tie-toe) is one of the oldest and biggest names in the arcade industry. We're the world's largest manufacturer and operator of arcade games. Taito's been in the business since 1953.

And that's just the beginning. Taito practically started the video game industry with our classic arcade hit, Space Invaders.™ And over the years, Taito has created more than 1,000 other great action games for arcade and home play.



ARKANOID: 33 screens of space-age excitement. Award winning coin-op hit. Over 1 million sold in Japan. "One of the best ever." —Electronic Game Player Magazine.

RENEGADE: This is the one and only. Don't settle for imitations. Blistering, fast paced and real life street-style Karate action. One of the hottest games in Europe.

Taito has something equally exciting for you to slip into your home computer. Taito brings the same pioneering spirit, technical quality and excitement that made us the arcade leader to your Commodore, Amiga, IBM, Apple and Atari computers. Your computer won't be the same again.

Taito is the arcade industry leader for a very good reason. We consistently make great video games that bring more action, thrills and value to the people who play our games. And literally millions of people play our games in arcades and homes all over the world.

Our strength comes from the massive development effort we put into creating the kind of games that satisfy the ever-growing arcade appetite and the research gathered from the more than 100,000 arcade machines Taito operates in Japan. (The money in the coin boxes at the end of the day tells you quickly if you've got

ALCON: The ultimate in inter-planetary combat. Battle aliens with lasers, homing missiles, bombs and shields. Fantastic vertical scrolling future-world landscapes.

Taito Software Inc., 267 West Esplanade, North Vancouver, B.C., Canada V7M1A5. Tel: 604-984-3344. Taito,® Arkanoid,™ Renegade,™ Alcon,™ Rastan,™ Bubble Bobble,™ Operation Wolf,™ Sky Shark™ and Gladiator™ are trademarks of Taito America, Inc. Copyright ©1988. All rights reserved. Amiga, Commodore, Apple, IBM and Atari are trademarks respectively of Commodore-

a good game or not.) And Taito is always working hard to develop the most exciting new video games that push the technology to its limits. We don't rest on our laurels.*

Because arcade games are the benchmark for home video games, Taito's leadership in the arcade industry means that when you buy Taito products you will be getting more home video thrills —more mesmerizing arcade quality graphics, spell-binding sound and above all, action!

RASTAN: One of the biggest coin-op hits of 1987. Stunning graphics. Non-stop, mythical super hero action with multiple weapons, enemies and levels of play.

That's why nobody but Taito can bring you more of what you're looking for in home computer video games. You don't get to be the biggest in the arcade business by making run of the mill video games.

BUBBLE BOBBLE: Laugh-packed addictive action. Up to 100 levels of arcade quality play. One or 2 player action. The number one game in Europe for three months in a row.

When you buy Taito games you're getting more than just fun. We bring you games that test your nerve, your skill and your strategy. Games that make you laugh and put you on the edge of your seat, games of adventure and excitement. Taito takes you on incredible mind voyages to places you've never been before—to brave new worlds of imagination and fantasy. And after all, isn't that what great video games are all about?

And every action game we put our name on is more than just competitive confrontation. Taito games are all about the values of good triumphing over evil, of being the best you can be—games like Arkanoid,™ Renegade,™ Alcon,™ Rastan™ and Bubble Bobble.™ And we have more arcade block-busters like Operation Wolf,™ Sky Shark™ and Gladiator™ coming soon to software formats for play on your home computer. Taito's home-bound hit parade of video fun has just begun.

Who but the arcade leader could bring you so much? That's Taito! Aren't you glad you asked?

Buy Taito products at leading computer stores everywhere. If no stores are near you, Visa/MasterCard holders can order direct from anywhere in the United States by calling 1-800-663-8067. TAITO

Amiga, Inc., Commodore Electronics, Ltd., Apple Computer Inc., International Business Machines and Atari Corporation. Advertisement by Qually & Company Inc., (Chicago.) *If you think you've got the technical and creative ability to develop mind-blowing video games, write to Taito, Attention: Product Development, at the above address.

JUMP OUT OF THE PAGES...
And into the heart-pounding simulation.

C-64/128
Red Storm Rising
THIS IS SIDE 1
(Side 2 on back)
MICRO PROSE
SIMULATION • SOFTWARE
180 Lakefront Drive•Hunt Valley•MD 21030
(301) 771-1151
WARNING: This Microprose software is copy protected. Tampering of any kind with the diskette may result in damage to your software program and may invalidate your warranty. © 1987

RED STORM RISING is one of the most dramatic and detailed stories of modern warfare ever written. Read by millions, its gripping realism has become the hallmark of author Tom Clancy and his technical collaborator Larry Bond.

Their counterpart in entertainment software, MicroProse founder Sid Meier, is the world's leading creator, designer and programmer of simulation software. His award-winning titles, including F-15 STRIKE EAGLE and SILENT SERVICE, have sold more than two million copies and are renowned for their authenticity and originality.

Now these three masters have combined talents to bring the excitement of **RED STORM RISING** to your computer screen. YOU can step into the command center of a nuclear attack submarine in this super high-technology simulation of strategy and tactics. But unlike the book, you can't turn the pages to see how it ends.

You have to live it.

RED STORM RISING... for Commodore 64/128. Coming soon for other popular systems. Available at a Valued MicroProse Retailer (VMR) near you; call for locations. If not found locally, call or write MicroProse for MC/VISA orders.

MICRO PROSE™
SIMULATION • SOFTWARE

180 Lakefront Drive • Hunt Valley, MD 21031 • (301) 771-1151

RED STORM RISING, the book, copyright 1986, Jack Ryan Enterprises, Ltd. and Larry Bond. Published by G.P. Putnam's Sons, New York.

COMPUTE!'s GAZETTE contents

September 1988 Vol. 6, No. 9

features

Extra! Extra! Write All About It! *Tom Netsel* ..... **12** *
Putting It to Work *Mickey McLean* ..... **14** *

reviews

Déjà Vu *Neil Randall* **28** **64**
Ticket to Washington, D.C. *David and Robin Minnick* **29** **64**
X-15 Alpha Mission *Ervin Bobo* **34** **64**
Star Empire *Keith Ferrell* **35** **64**

games

Lincoln Green *Robert Bixby* **37** **64**
Boom and Bust *Fred Karg* **38** **64**
Lava Flow *Forrest Bentley* **39** **64**

programming

BASIC for Beginners: The Pigeonhole Analogy *Larry Cotton* ..... **42** **128/64/+4/16**
The Programmer's Page: Did You Know That . . . *Randy Thompson* ..... **45** **128/64/+4/16**
Machine Language Programming: Debugging *Jim Butterfield* ..... **46** **128/64/+4/16**
Pattern Fill *Robert Bixby* **54** **64**
Multicolor Graphics Dump *Hubert Cross* **56** **64**
Multicolor Graphics and Video Storage *Dale McBane* **57** **64**
ML Boot *David Roth* **59** **64**
SpeedCheck 128: A Spelling Checker for *SpeedScript 128* *Larry D. Smith* **60** **128**
Disk Package *Barry Camp* **62** **64**
MultiSort 128 *James E. Borden* **66** **128**

departments

The Editor's Notes *Lance Elko* ..... **4** *
Letters to the Editor ..... **6** *
Feedback *Editors and Readers* ..... **22** *
D'Iversions: Murder at Palenque *Fred D'Ignazio* ..... **26** *
Horizons: Counting People and Making Faces *Rhett Anderson* ..... **44** *
The *GEOS* Column: Quick Clock *Ernest Hunter* **47** **128/64**
User Group Update *Mickey McLean* ..... **53** *
Bug-Swatter: Modifications and Corrections ..... **55** *
News & Products ..... **68** *

program listings

How to Type In *COMPUTE!'s Gazette* Programs ..... **90** *
The Automatic Proofreader ..... **92** **128/64/+4/16**
MLX: Machine Language Entry Program for Commodore 64 ..... **94** **64**

Advertisers Index **100**

*=General, **64**=Commodore 64, **+4**=Plus/4, **16**=Commodore 16, **128**=Commodore 128

Cover art by Rhett Anderson

COMPUTE!'S GAZETTE (ISSN 0737-3716) is a COMPUTE! Publication, and is published monthly by ABC Consumer Magazines, Inc., 825 Seventh Ave., New York, NY 10019, a division of ABC Publishing, Inc., a Capital Cities/ABC Inc., company. © 1988 ABC Consumer Magazines, Inc. All rights reserved. Editorial offices are located at Suite 200, 324 West Wendover Ave., Greensboro, NC 27408. Domestic subscriptions: 12 issues, $24. POSTMASTER: Send address changes to COMPUTE!'s GAZETTE, P.O. Box 10957, Des Moines, IA 50340. Second class postage paid at New York, NY and additional mailing offices.

editor's notes

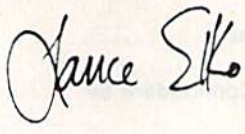
We recently returned from the Summer Consumer Electronics Show (CES), a biannual event that's billed as the world's largest trade show. Traditionally, we've run fairly extensive stories on CES, listing the dozens and dozens of new products announced at the show. This time, however, we decided to cover the new software products—there was little if anything new in the way of hardware—by reviewing some of these products in the remaining three 1988 issues, and by including others in the "News & Products" section of the magazine. (Several of the products are highlighted in this month's "News & Products," on page 68.)

In contrast with the CES shows we've covered in the past five years, this year's event was less frantic. In the computer section of the show, much of the hype was generated by videogame-machine products from Nintendo, Sega, Atari, Taito, and others. Their booths were enormous, and they drew constant attention by hosting special autograph sessions with celebrities such as Andre the Giant, Reggie Jackson, and Doug Williams. Commodore, again this year, did not appear. (The company has been focusing of late on COMDEX, a biannual business-oriented show, where its emphasis is on the Amiga line.)

However, there were dozens of 64s and 128s in most of the software publishers' booths—and each one, in quiet contrast to the hoopla surrounding the videogame machines, was demonstrating a new product.

One of these new products was *GEOS* 2.0. Berkeley Softworks' upgraded operating system for the 64 now combines *GEOS*, geoWrite, and geoSpell, and adds an upgraded deskTop and geoPaint 2.0. It includes many other new features and enhancements to version 1.3. *GEOS* 2.0 appears to be a major upgrade, and a thoughtful one. The demo we saw was very impressive. The result of user research and customer-service feedback, *GEOS* 2.0 also offers support for the 1764 and 1750 RAM Expansion units. (Look for a full review in an upcoming issue.) Its price is set at $59.95, but the package will be available for $29.95 to current (1.3) *GEOS* owners.

Speaking of *GEOS*, don't forget the $25,000 *GEOS* Programming Contest sponsored by Berkeley Softworks and *GAZETTE*. We've run ads containing contest details and an entry blank in the April–August issues. The deadline for entries is August 31, so if you use *GEOS* and know how to program, get on your horse. We've received only a couple of entries thus far, and there are 24 prizes to be given away—cash, software, peripherals, and subscriptions to Q-Link and *GAZETTE*. We'll be looking for your program.



Lance Elko
Senior Editor

COMPUTE!'s GAZETTE
FOR COMMODORE PERSONAL COMPUTER USERS

Editor **Lance Elko**
Senior Art Director **Janice R. Fary**
Features Editor **Keith Ferrell**
Technical Editor **Patrick Parrish**
Assistant Editor **Rhett Anderson**
Assistant Technical Editor **Dale McBane**
Assistant Features Editor **Tom Netsel**
Assistant Editor, Submissions & Disk Products **David Hensley**
Editorial Assistant **Mickey McLean**
Copy Editors **Karen Siepak, Tammie Taylor, Karen Uhlendorf**
Programming Assistant **Troy Tucker**
Contributing Editors **Randy Thompson, Jim Butterfield** (Toronto, Canada), **Fred D'Ignazio** (E. Lansing, MI)

ART DEPARTMENT
Assistant Art Director **Robin Strelow**
Junior Designer **Meg McArn**
Mechanical Artists **Scotty Billings, Robin Case**

PRODUCTION DEPARTMENT
Assistant Production Manager **De Potter**
Production Assistant **Kim Potts**
Typesetting **Terry Cash, Carole Dunton**
Advertising Production Assistant **Anita Armfield**

COMPUTE! PUBLICATIONS
Group Vice President, Publisher/Editorial Director **William Tynan**
Managing Editor **Kathleen Martinek**
Senior Editor **Lance Elko**
Editorial Operations Director **Tony Roberts**
Executive Assistant **Sybil Agee**
Senior Administrative Assistant **Julia Fleming**
Administrative Assistants **Iris Brooks, Cathy McAllister**

ABC CONSUMER MAGAZINES
Senior Vice President **Marc Reisch**
Vice President, Finance **Richard Willis**
Vice President, Production **Ilene Berson-Weiner**

CIRCULATION DEPARTMENT
Vice President **Robert I. Gursha**
Circulation Subscription Staff **Ora Blackmon-DeBrown, Harold Buckley, Mitch Frank, Beth Healy, Thomas D. Slater, James J. Smith, A. Heather Wood**
Subscriber Service **(800) 727-6937**

One of the ABC PUBLISHING Companies

President Robert G. Burton
1330 Avenue of the Americas
New York, NY 10019

ADVERTISING OFFICES
New York: ABC Consumer Magazines, Inc., 825 Seventh Ave., New York, NY 10019. Tel. (212) 265-8360. Peter T. Johnsmeyer, Group Advertising Director; Bernard J. Theobald, Jr., Advertising Director
Greensboro: COMPUTE! Publications, Suite 200, 324 West Wendover Ave., Greensboro, NC 27408. Tel. (919) 275-9809. Kathleen Ingram
New England & Mid-Atlantic: Bernard J. Theobald, Jr., (212) 315-1665; Peter Hardy (617) 681-9000.
Midwest & Southwest: Jerry Thompson, Lucille Dennis (312) 726-6047 [Chicago]; (713) 731-2605 [Texas]; (303) 595-9299 [Colorado]; (415) 348-8222 [California].
West, Northwest, & British Columbia: Jerry Thompson, Lucille Dennis (415) 348-8222.
Southeast & International: Peter Hardy (617) 681-9000.

Address all advertising materials to: Anita Armfield, COMPUTE! Publications, Inc., 324 West Wendover Ave., Suite 200, Greensboro, NC 27408

Editorial inquiries should be addressed to The Editor, COMPUTE!'s GAZETTE, Suite 200, 324 West Wendover Ave., Greensboro, NC 27408

PRINTED IN THE U.S.A.

When the Bard's scared sober, trust a thief

. . . like me.

When the Bard's Tale began, we lived a charmed life. Good ale. Good song. Good company. Mangar came along, but we cut him to pieces before he could blink. Soon the world got bigger, and its problems got bigger. We wandered the wilderness for months to find the pieces of that infernal Destiny Wand. But once we reforged it, Lagoth Zanta was history.

Back then, being a thief was dull. Pick this lock. Disarm that trap. When things got hot, they'd tell me "Into the shadows, wimp." I should've lifted their gold and split long ago. But it's too late now.

We battle through the seven worlds. Cast Warstrike and Rimefang over and over. Cut down the endless Hookfangs and Slathbeasts. And suddenly, The Archmage is powerless. The Warrior is weak. The Bard can't play. *Now* they say I'm the only hope. I'm slick. I'm sneaky. And *I'm* going to fight the Mad God . . . alone.

Some fate.

Rainbow Dragon breathes at the party...
Redbeard repelled the attack!
Rainbow Drago
Character
AC Hits Cond SpPt
1 Ironpants -21 659 659 0
2 Greenbolt -42 621 621 31
3 Backstabber -24 417 417 0
4 El Cid -20 738 738 0
5 Corvin -9 589 589 169
6 Lorini -12 418 418 287
7 Redbeard -9 473 473 397

Over 500 colorful, animated kinds of monsters want to meet you. Some might even join your party.

Rogue abilities
Disarm traps 58.
Identify chest 58.
Identify item 58.
Hide in shadows 58
Critical hit 58.
Press any key...
Lefty
Character
AC Hits Cond SpPt
1 Lefty -7 384 112 0
2 Ironpants -21 659 659 0
3 Greenbolt -42 621 621 31
4 Backstabber -24 417 417 0
5 El Cid -20 738 738 0
6 Corvin -9 589 589 169
7 Lorini -12 418 418 287

Your stats show you're hot at lock picking, trap disarming . . . and hiding. Need more help than that? Seven kinds of spellcasters—including new Chronomancers and Geomancers—cast over 100 spells.

ESC to abort
Mountain
Character
AC Hits Cond SpPt
1 Lefty -4 Dead 0 0
2 Ironpants -21 659 521 0
3 Greenbolt -42 621 483 0
4 Backstabber -24 417 279 0
5 El Cid -20 738 738 0
6 Corvin -9 589 571 47
7 Lorini -12 418 272 287

New auto-map feature lets you find your way in the 84 dungeon levels and seven dimensions. No copy protection to slow you down. Save the game at any location.

FREE CLUES
See participating retailers for full-color clue poster.

THE BARD'S TALE™ III
THIEF OF FATE™

3 WAYS TO ORDER:
1) Visit your retailer.
2) Call 800-245-4525 from U.S. or Canada, 8am to 5pm PST, to order by VISA/MC.
3) Mail check (U.S. $) or VISA/MC #, cardholder name, and exp. date to Electronic Arts Direct Sales, P.O. Box 7530, San Mateo, CA 94403. Apple II version $49.95, Commodore version $39.95, plus $3 shipping/handling. CA residents add 6.5% sales tax. Allow 1–3 weeks for U.S. delivery.

ELECTRONIC ARTS®

letters to the editor

More on 128D Woes

I have a comment in response to Donald Weaver's letter in this column (July).

Last December, I purchased my first computer, a 128D, at the local Sears store. Fortunately, I also purchased an extended warranty/maintenance agreement. From December through May, I've had *seven* defective 128Ds, six of which had defective drives. At first, the Sears salespeople denied knowledge of any problem with any 128s that had been sold. In time, I talked to the manager of Sears customer service and got a completely different story.

I love my 128D when it works. The last one has a low serial number (000 series) and has been working like a charm for four weeks, but as every day passes, I live in fear that it will break down, too.

Commodore Customer Service representatives were less than helpful and treated me with gross indifference. Until they work out the problems, I wouldn't recommend the 128D to anyone.

P.S. The serial numbers of the bad 128Ds were 004093 and higher.

Charles E. Cross, Jr.
Flushing, MI

This is in response to Donald Weaver's letter in the July issue. It would seem unusual for Commodore to say they were not aware of problems with the 128D's internal drive. I purchased a 128D last November. When it arrived, it was impossible to load any programs. A local service dealer tested it and concluded it had a bad head.

In any event, I decided to exchange the computer for another. This one I still have. It does not work consistently either, but it gets by. I simply do not wish to give it up because I use it daily, and another service man indicated it would be at least three weeks to service, assuming Commodore would supply the parts promptly, which he indicated they are not noted for. I wrote a detailed letter to Commodore. The only response I received was that that was too bad, but they couldn't help me.

I've heard of a fix to the head where a spring from an IBM disk drive is substituted for the spring on the read head, but as long as the computer doesn't fold completely, I just grumble to my wife and keep assuring myself that I will never buy another Commodore computer.

R. H. Schuette
Blaine, MN

We've received a large number of letters lately complaining about Commodore's customer service. For years, their track record in this area has been spotty at best. As a result, it's certain that they lose repeat customers, not to mention potential sales from disgruntled owners who discourage others from considering a Commodore machine. We hope that some of the folks at Commodore are reading this.

Commodore's PC Compatible

Last Christmas, I purchased a Commodore PC10-1 computer. *COMPUTE!'s Gazette* contains the names and addresses of many dealers distributing printers, software, and modems for Commodore 64s and 128s; however, I am unable to find any information regarding the availability of supporting accessories for the PC10-1.

Robert J. Zeph
Commack, NY

The PC10-1 is an IBM PC-compatible computer that Commodore distributed for several years in Europe. In 1985–1987, interest in PC compatibles as home machines swelled in the U.S. as prices dropped and more and more nonbusiness software became available. IBM PC compatibles—almost all of which use the MS-DOS operating system—abounded and are still selling like hot cakes.

*Commodore's PC10-1, introduced to the U.S. market in 1985, is one of hundreds of compatibles now on the market. What you need, then, are peripherals and software for PC compatibles (or MS-DOS machines, the term many software publishers use on packages to indicate machine compatibility). If you're looking to find mail-order products for the PC10-1, you need to pick up a magazine for the PC/compatible owner, of which there are dozens. Our sister publication—*COMPUTE!'s PC Magazine*—is dedicated to exclusive coverage of the PC/compatible market and includes many reviews and ads for products that support this market. Our flagship magazine,* COMPUTE!, *also features some PC coverage and PC mail-order ads.*

Page Polemics

May I take this opportunity to tell you of something about *GAZETTE* that's been bugging me for a long time? It's the numbering of pages, or rather, the absence thereof. In the May issue, there are 116 pages, of which only 66 are numbered; the table of contents on page 3 (not numbered) gives the page numbers of articles, but three of the pages referred to have no numbers. Pages 19 and 21 are identical (part article, part ad), yet 19 is numbered and 21 isn't. Please number every page.

Syd Hislam
Los Altos, CA

Never say readers don't notice everything. You make some good points and certainly caught a few inconsistencies. The general rule is that all pages should have numbers except for those with full-page ads or those with fractional ads positioned on the outside bottom edge of the page. We can't make room on someone's ad for our page number, and we can't put it below the ad because it might get trimmed off at the bindery. We'll try to be more consistent in the future.

"I'VE PUT MY COMPANY ON THE LINE FOR YOU."
MAX TOY
President
Commodore
Business
Machines
A direct line, that is, from your home to Commodore® Headquarters via Q-Link, the telecommunications service that's everything a Commodore owner could hope for.
Using a Commodore 64® or 128,™ disk drive, modem, and the Q-Link software, you're connected to inside information and help from the programmers and designers here at Commodore who built your machine. It's the best way I know to get you the answers quickly and personally.
Q-Link is also your link to leading Commodore software publishers and their wares, to over 15,000 public domain software programs you can download and keep, to teachers who'll help your kids with their homework, and to clubs, contests, games, and a host of other services that run the gamut of your imagination.
Experience it for yourself. And see why I've put my company on the line for you.
1-800-782-2278 ext. 1554
Join Q-Link today and you'll get a Commodore 300 baud modem and the Q-Link software free!
Quantum Link
8619 Westwood Center Drive
Vienna, VA 22180
This offer valid for new members only.
SPECIAL OFFER
Call today to find out about our special 1200 baud modem offer.

WE'VE GOT S
SEVEN TIMES BET

GEOS
GRAPHIC ENVIRONMENT OPERATING SYSTEM
2.0 VERSION
A state of the art word processor, spell checker, graphics editor, file manager and more!
For Commodore 64 and 64c Computers
Berkeley Softworks

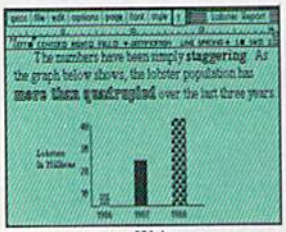
If we told you there's something that's seven times better than GEOS,™ would you believe it? Well, believe it. It's called GEOS 2.0.™ And it's filled with new features, including the one thing you'd expect from a package bearing the GEOS name.

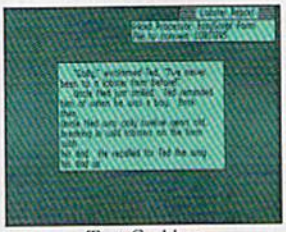
Power.

Not the kind that sends a small surge through your creativity. We're talking about major productivity power.

GEOS 2.0 is supercharged with new strengths that make it the most powerful source of integrated software your Commodore 64's ever seen. And what isn't completely new has been radically improved. In fact, we actually included other applications—products we used to sell separately—right into this package.

For example, the entire contents of geoWrite Workshop, including geoWrite 2.1™ (the full-featured word processor) have been added along with geoSpell.™ And a new feature lets you mix graphics with text around any number of columns.


geoWrite


Text Grabber

geoSpell

It doesn't even matter if the text is from some other Commodore-based program. Because GEOS 2.0 converts it with one simple point and click.

There's a new deskTop.™ A new painting toolbox. And new muscle that makes your mouse much mightier, for starters.

So go ahead. Try GEOS 2.0. It may be our second version, but we guarantee it's seven times the experience.

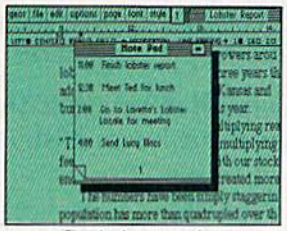
1. geoWrite 2.1: NEW! Full-featured word processor • Individual paragraph formatting • Expand margins to 8" • Left, right, center and full justification • Multiple vertical spacing options • Headers and footers • Decimal tabs • Full page preview • Search and replace • Word wrap • 10 fonts in 7 styles and multiple sizes • Pagination • Insert, delete, move or copy • Mix text and graphics • Special feature to create multiple columns, add headlines and borders • Produce near-typeset quality output on an Apple® LaserWriter™ with PostScript.™

2. Text Grabber.™ NEW! Import text from any Commodore word processor such as

SOMETHING TTER THAN GEOS.

PaperClip,™ Easy Script,™ Speed Script,™ Word Writer™ and others.

3. geoMerge:™ NEW! Create customized form letters and labels with this mail merge program.



Desk Accessories

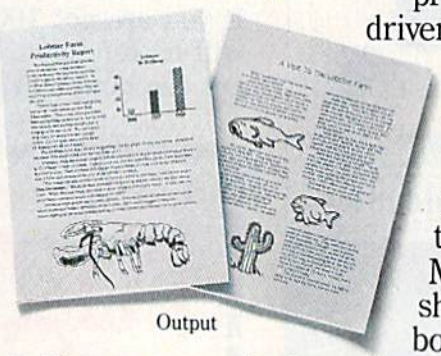
4. geoSpell: NEW! Complete spelling resource. View dictionaries and documents while spell checking • Create and update personal dictionaries • Global search and replace • Operates 38% faster than before.

5. Desk Accessories: Five handy utilities accessible from within any application • 4 function calculator • 127 page notepad • Chiming alarm clock • Preference manager • Photo/text managers to save and transfer data between applications • NEW! Cut and paste from the calculator and notepad into other applications • Name photo album pictures • And more.

6. geoPaint:™ High resolution graphics editor. Create charts, diagrams or images up to 8″ × 10″ • Zoom in for detailed pixel editing or preview entire page • 16 colors, 14 graphic tools, 32 brush shapes and 32 painting patterns • Invert, rotate, mirror or move images • Cut, copy and paste into other GEOS applications • Integrate text with graphics • NEW! Stretch and scale images • Overlay effects • Stop pattern fills in progress • New graphic shapes including connected lines, ellipses and squares • Grid function for easy sketching.

geoPaint

deskTop



Output

7. deskTop: Efficient file and disk manager • View files as icons or text • Sort files by size, type, date or name • Open, close, rearrange, copy or delete files • Manage non-GEOS files • Access and execute BASIC programs • NEW! Support for 2 drives and a RAM Expansion Unit (including the 1541, 1571, 1581 and RAM drives) • Multiple file selection • Color code notepad and files • Date and time display • Recover most recently deleted file • Faster file copying • Simplified printer and input driver selection.

PLUS: diskTurbo™ runs GEOS applications five to seven times faster • More keyboard shortcuts • Keyboard or input device options (mouse, joystick, lightpen or Koala Pad™) • 31 printer drivers support over 70 popular printers in draft, NLQ and high resolution printing modes • Q-Link™ telecommunications software.

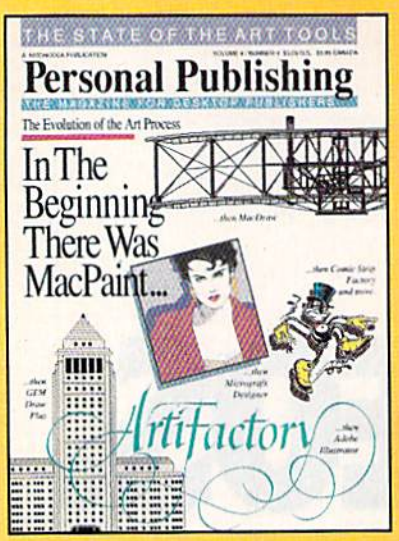
For orders only, call
1-800-443-0100 ext. 234
GEOS 2.0
(California residents add 7% sales tax)
$59.95 plus $4.50 for shipping and handling.

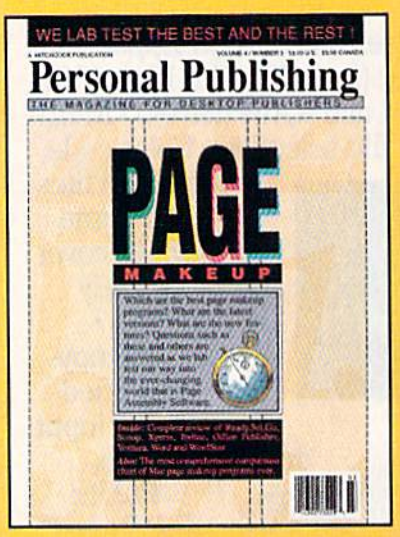
Commodore, Commodore and C64 are trademarks of Commodore Electronics, Ltd. GEOS, geoSpell, geoLaser, geoMerge, geoPaint, geoWrite and Berkeley Softworks are trademarks of Berkeley Softworks. PaperClip, Easy Script, Speed Script, Apple, LaserWriter, PostScript, Koala Pad, Q-Link and Word Writer are trademarks of companies other than Berkeley Softworks.

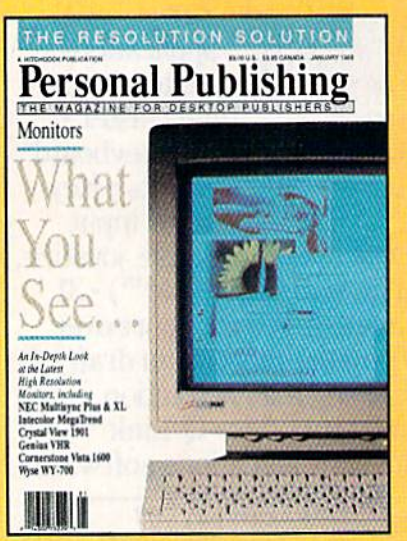
GEOS 2.0 GEOS COMPATIBLE

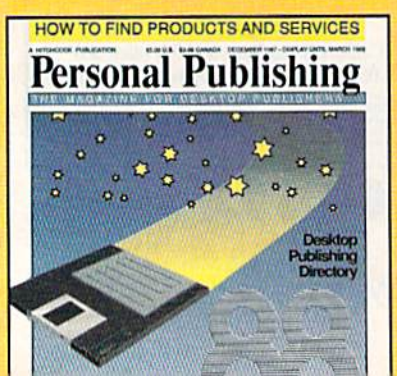
Berkeley Softworks

The brightest minds are working with Berkeley.


THE STATE OF THE ART TOOLS
Personal Publishing
THE MAGAZINE FOR DESKTOP PUBLISHERS
The Evolution of the Art Process
In The Beginning There Was MacPaint...
ArtiFactory







The Power To Publish.™

Desktop publishing gives you the power to publish. But to be a desktop publisher, you need the skills and know-how that *Personal Publishing* magazine brings you every month.

Each issue contains the latest information on how to put desktop publishing to work for you—with articles and reviews of the latest desktop publishing hardware and software, and how to master them.

Page makeup software, laser printers, graphics programs, the right computers, design advice, typography—all tools needed to succeed with desktop publishing, and all covered in the pages of *Personal Publishing*, The Magazine for Desktop Publishers.

Give yourself the power to publish. Give yourself the most important tool a desktop publisher can have: a subscription to *Personal Publishing*.

Subscribe now and save 33% off the regular newsstand price.

If you are not 100% satisfied, the unused portion of your subscription will be refunded. Don't spend another penny on type or art until you get the power to publish—in the pages of *Personal Publishing*.

Right Now!

Give Me The Power To Publish.
Start my subscription to Personal Publishing for only $24. A $12 savings off the newsstand price.

[ ] $24 [ ] $36 Canada [ ] $48 Foreign
[ ] Payment Enclosed [ ] Bill Me

Name _____

Company _____

Address _____

City _____ State ____ Zip _____

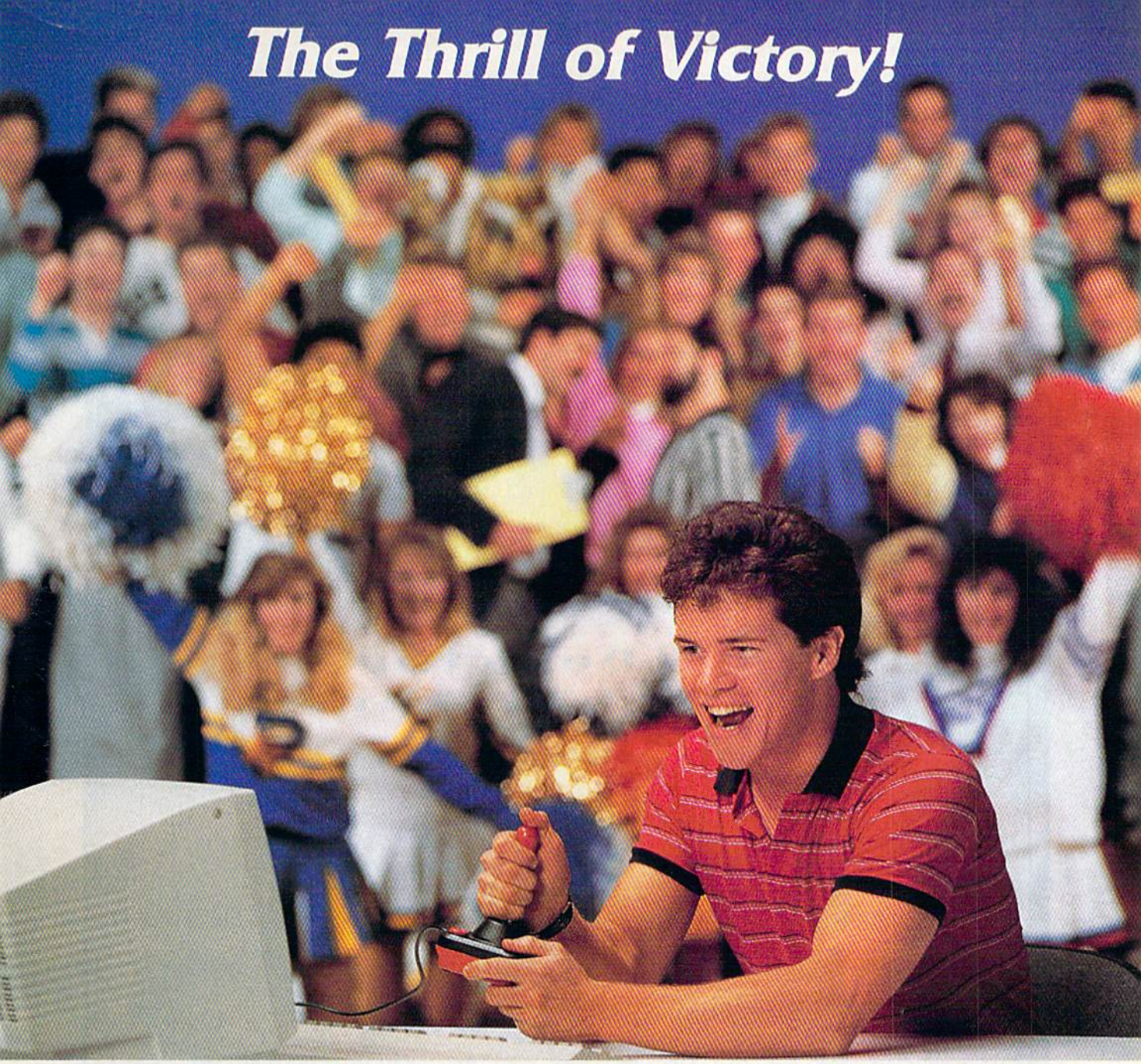
CG

Return coupon to: Personal Publishing,
P.O. Box 3019, Wheaton, IL 60189-9900.
Or Call **1-800-627-7201** for faster service.

Save 33%

Off The Newsstand Price and Save $12 When You Subscribe now to* Personal Publishing, *The Magazine for Desktop Publishers.

The Thrill of Victory!



NEW! *Through Exclusive Arrangement with Bally™*

You look up at the clock...eight seconds to play...the score's tied. You streak towards the goal, weaving and bobbing. You fake inside...the goalie lunges...slapshot...score...the crowd goes wild!

You're in a bunker just off the green. You need par to keep it even. You swing...the ball floats out in a puff of sand. It rolls gently breaking towards the hole...then drops. You've won!

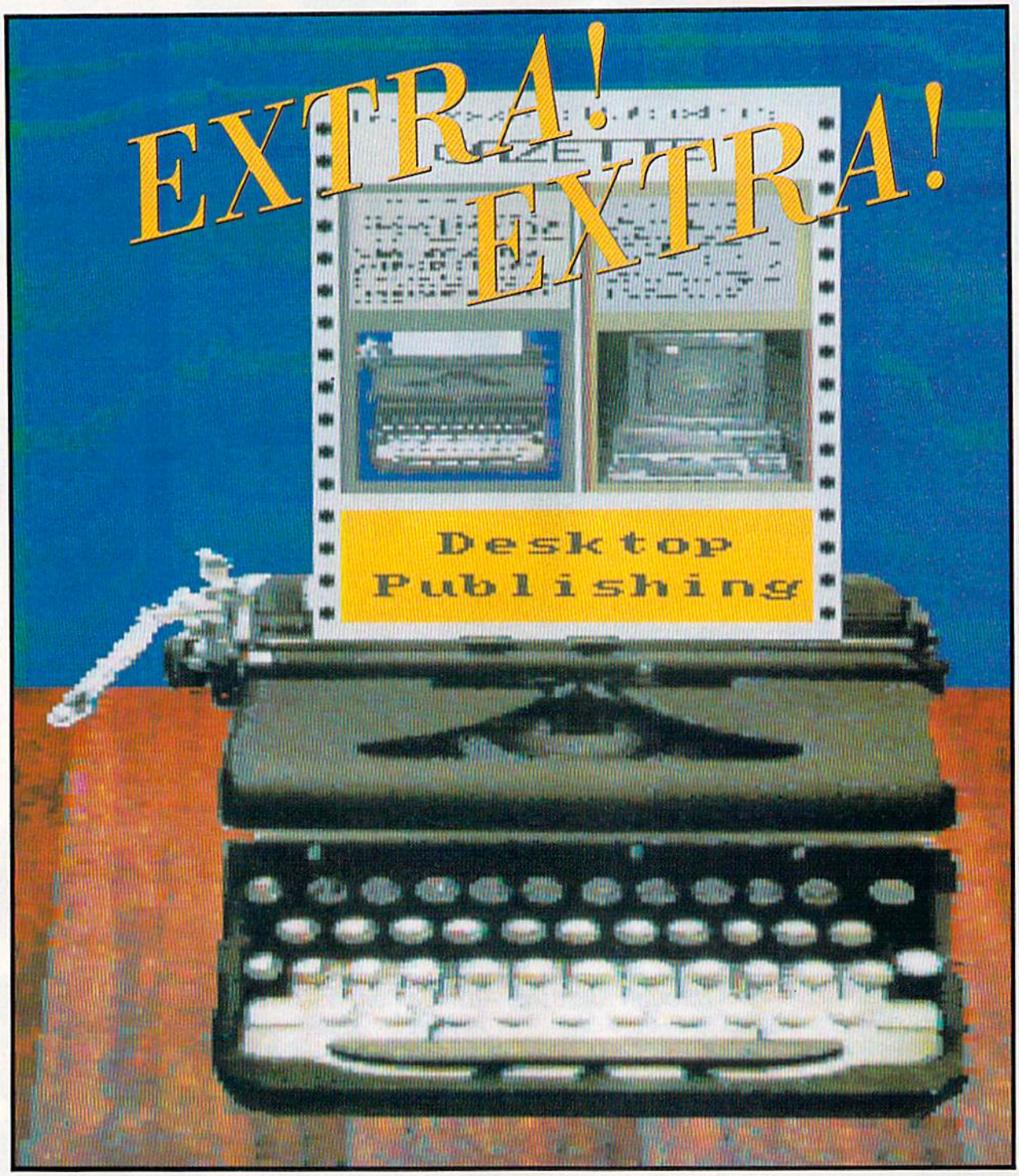
HAT TRICK™ and **MINI-GOLF™** by CAPCOM put the thrill and excitement of competitive sports in your Commodore. Vibrant graphics make these games so real that you can feel the pressure of intense athletic competition. The outcome of these CAPCOM Sports Series challenges depends upon your quick reflexes and brilliant strategy.

CAPCOM's **HAT TRICK™** and **MINI-GOLF™**—games so real you can hear the roar of the crowd!

CAPCOM

CAPCOM U.S.A., Inc.
1283-C Mountain View/Alviso Road
Sunnyvale, CA 94089
408-745-7081

Commodore is a registered trademark of Commodore Electronics Ltd., Hat-Trick and Mini-Golf are under license from Bally Sente, Inc.



Does printer's ink run in your veins? Do you have visions of becoming the next William Randolph Hearst, heading up your own publishing empire? Maybe your printing ambitions are more modest, and you'd just like to turn out a monthly newsletter to keep members of your user group up-to-date on the latest happenings. Whatever your journalistic ambitions, you may want to consider desktop publishing on your 64 or 128—at least until you buy your first newspaper.

WRITE ALL ABOUT IT!

Desktop publishing on an eight-bit computer? Better leave that to the big boys. It takes at least a Mac or a PC with a couple of gigabytes of memory. Right?

Wrong. The 64 and the 128 are like the bumblebee that doesn't know it can't fly; nobody told them that they couldn't be used for desktop publishing.

Until recently, Commodore owners could print greeting cards, banners, and simple flyers with such programs as Broderbund's *Print Shop*, Cardinal's *Banner Machine*, and Springboard's *Certificate Maker*, but if your publishing needs were more complex, you usually had to resort to using conventional printing techniques or buying something a lot more expensive than a 64 or 128. Now, though, several full-blown desktop publishing programs are on the Commodore market, and they contain some very sophisticated features.

Conventional Printing Techniques

Before examining desktop publishing, let's take a look at some of the steps required to publish a newsletter by conventional methods. Desktop publishing can be better appreciated if you understand the mechanical process it partially eliminates.

To create a professional-looking newsletter by conventional methods takes time, a little talent, and a few dollars. Once you've decided on your newsletter's content, you have to write the copy on a typewriter or word processor and then take it to a typesetter, who will convert it into the desired type style, size, and column widths of your publication.

Before you get this far, however, you'll need a layout. You have to know what your newsletter is going to look like if you're to tell the typesetter how wide to make the columns and what fonts to use for the text and headlines. Since there are hundreds of fonts available, type styles and sizes have to be specified exactly. If you have a special requirement, such as having the text wrap around a graphic, that has to be carefully measured and specified in your layout.

Once the typesetter returns your formatted text on long strips of paper, each column has to be cut and pasted onto a board that matches your layout. Headlines, text, and captions must be carefully aligned and smoothed into place. If a story is too long or too short to fit its allotted space, you have to either change the layout, cut the text, or send additions to the typesetter.

Tom Netsel, Assistant Features Editor

Typesetters usually don't charge to correct typos or mistakes they introduce, but waiting for a correction can delay publication. If you change your mind about your layout or make a mistake with your specifications, don't expect the typesetter to do the job again at no extra charge. If you specified 48-point headlines but only have room for 36-point type, or if you suddenly decide you don't like Bodoni Book and want your article set in Garamond Roman, expect extra expense and delay.

Graphics introduce additional problems. If you want to include a photograph, it has to be sized and *screened*—converted to tiny dots so it can be printed. Screening requires a separate process. A simple line drawing may be pasted in place if it's the correct size, but it has to go through another process if it has texture or shades of gray or if it needs sizing.

When this *mechanical art* has been pasted in place, all the decorative lines, borders, and boxes have been added, and everything has been proofed a final time, the board then goes to a printer for the actual printing process.

Desktop Publishing Power

Desktop publishing puts you in control of all these steps, but you don't have to be a professional printer to get good results. However, you'll still need a layout before you use any publishing program.

Most newsletters have a name that appears at the top of the front page. This banner usually stays the same issue after issue, and the number of columns in your publication usually remains constant as well. This basic layout gives you the framework on which to build each edition.

It's always a good idea to make a sketch of each page. Decide where stories begin, how much room to leave for headlines, and where you want to place any graphics. From that point, all the work is done on the computer screen.

Text is usually written on a word processor and then saved to disk. Most publishing programs let you import these text files to the pages and columns you specify. You also can enter text directly for editing purposes and for writing captions and headlines. With some simpler programs, this is the only way to enter text into your document. Publishing programs don't work with all 64 and 128 word processors, so make sure the program you're considering supports your favorite word processor.

Importing text is easy. In most cases, you simply define a box and specify the file you want printed there. Define another box and write a headline. If you don't like a particular font, hit a few keys, and it's quickly changed. Most publishing programs offer a variety of typefaces in sizes suitable for text and headlines. Try one font, and if you don't like it, switch to another. You're never charged for overtime.

Pictures spice up any publication, and your newsletter is no exception. Popular publishing programs include an editor that lets you create your own graphics, edit commercial clip art imported from other programs, or use drawing programs such as *DOODLE!*.

Putting It to Work

Mickey McLean

Desktop publishing is making a difference in the way user-group newsletter editors communicate with their readers.

The editors are using several programs, including *The Newsroom* from Springboard, *geoPublish* from Berkeley Softworks, and Electronic Arts' *PaperClip Publisher*. The success of these products ensures that Commodore owners can look forward to more desktop publishing programs being released in the near future.

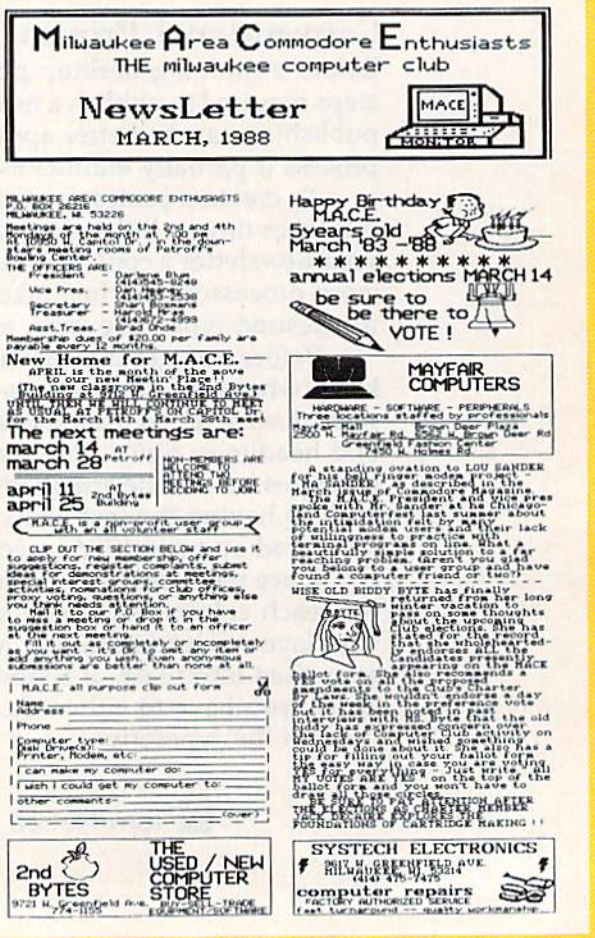
Straight from *The Newsroom*

The Milwaukee Area Commodore Enthusiasts (MACE) user group publishes a monthly newsletter for its members. Club vice president Dan Heaney uses *The Newsroom* on a Commodore 128 to produce the publication.

"Our club needed a newsletter last year, and we looked for something to do it with," Heaney says. "It *[Newsroom]* was about the only program available."

Heaney's options included printing the text from a word processor and then pasting up each page.

"Paste-up, even the little I do now, is a pain in the neck," says Heaney, who still has to paste up several advertisements to please certain clients. "Half the time, I don't feel like I'm getting it straight. Besides, I'd rather let the computer do it."


Milwaukee Area Commodore Enthusiasts
THE milwaukee computer club
NewsLetter
MARCH, 1988
MACE
COMMODORE MONITOR
MILWAUKEE AREA COMMODORE ENTHUSIASTS
P.O. BOX 26216
MILWAUKEE, WI. 53226
Meetings are held on the 2nd and 4th Mondays of the month at 7:00 pm at Central IV, in the downstairs meeting rooms of Petroff's Bowling Center.
THE OFFICERS ARE!
President - Darlene Blue (414)545-8249
Vice Pres. - Dan Heaney (414)475-2538
Secretary - Shari Bonnere
Treasurer - Hugo Bonnere (414)672-4998
Asst.Treas. - Brad Ohde
Membership dues of $20.00 per family are payable every 12 months.
New Home for M.A.C.E.
APRIL is the month of the move to our new Keetin' Place!!
(The new classroom in the 2nd Bytes Building at 9721 W. Greenfield Ave.)
UNTIL THEN WE WILL CONTINUE TO MEET AS USUAL AT PETROFF'S BOWLING CENTER for the March 14th & March 28th meet
The next meetings are:
march 14 AT
march 28 Petroff
NON-MEMBERS ARE WELCOME TO ATTEND TWO MEETINGS BEFORE DECIDING TO JOIN.
april 11 AT
april 25 2nd Bytes (Building)
M.A.C.E. is a non-profit user group with an all volunteer staff
CLIP OUT THE SECTION BELOW and use it to apply for new membership, offer suggestions, register complaints, submit ideas for Committees, start special interest groups, committee activities, nominations for club offices, proxy voting, questions, or anything else you think needs attention.
Mail it to our P.O. Box if you have to or bring it to a meeting or drop it in the suggestion box or hand it to an officer at the next meeting.
Fill it out as completely or incompletely as you want - it's OK to omit any item or add anything you wish. Even anonymous submissions are better than none at all.
M.A.C.E. all purpose clip out form
Name
Address
Phone
Computer type:
(Ask Brynek!)
Printer, Modem, etc:
I can make my computer do:
I wish I could get my computer to:
other comments:
(over)
Happy Birthday M.A.C.E.
5years old
March '83 -'88
annual elections MARCH 14
be sure to be there to VOTE !
MAYFAIR COMPUTERS
HARDWARE - SOFTWARE - PERIPHERALS
Three locations staffed by professionals
Mayfair Mall Brown Deer Plaza
2500 N. Mayfair Rd. 5082 N. Brown Deer Rd
Greenfield Fashion Center
7450 W. Holmes Rd
A standing ovation to LOU SANDER for his newsletter project.
Ha SANDER as described in the March issue of our newsletter, the M.A.C.E. President and vice president with Mr. Sander at the Chicago Commodorefest last summer about the frustration felt by many potential Amiga users and their lack of willingness to practice safe computing. Lou has a simple, yet elegant solution to a far reaching problem. If you don't belong to a user group and have found a computer friend or
WISE OLD BIDDY BYTE has finally returned from her long vacation and has decided to pass on some thoughts about the upcoming club elections. It has been related from the records that Biddy has wholeheartedly endorses ALL the candidates presently appearing on the MACE ballot form. She also recommends a YES vote on all the proposed changes to the Club's Charter. As far as she wouldn't endorse a day in the week in the past, but it has been RE-elected in fact interviewers that the old Biddy has expressed concern over the lack of computer illiteracy on Wednesdays and wished something could be done about it. She also has a tip for filling out your ballot - the easy way in case you are voting for a group of candidates. Just write ALL YES on the top of the ballot form and you won't have to draw all those circles.
ATTENTION AUTHORS
THE LEARNING ALPHABET
YOU'LL DISCOVER EXPLORES THE FOUNDATIONS OF CARTRIDGE MAKING !!
2nd BYTES
THE USED / NEW COMPUTER STORE
9721 W. Greenfield Ave. BUY-SELL-TRADE
774-1105 EQUIPMENT-SOFTWARE
SYSTECH ELECTRONICS
9611 W. GREENFIELD AVE.
MILWAUKEE, WI. 53214
(414) 475-7475
computer repairs
FACTORY AUTHORIZED SERVICE
Fast, turnaround --- quality workmanship

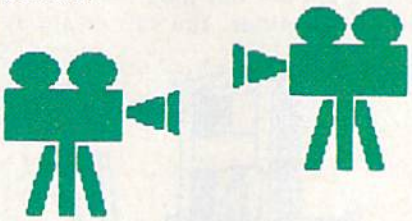
Since graphics and text can be combined so easily, place a picture almost anywhere in your layout, and the text automatically wraps around it. It's no problem if you change your mind and want to move the artwork later. Try making similar changes with conventional printing techniques, and you'll find it expensive and time-consuming.

The Newsroom

Springboard created *The Newsroom* ($49.95) for journalists of all ages who want to create newsletters, flyers, brochures, and forms on either letter-size or legal-size paper. It's the veteran of the Commodore desktop publishing entries. While it may not have all the latest features, it's probably the easiest to use.

Each letter-size page is divided into two columns of equal size. Each column is made up of three or four panels. If you plan to print your newsletter's name, logo, or slogan across the top of the front page, this banner occupies the space of two panels. The program also prints legal-size pages.

Enter *The Newsroom* at the Picture Menu, and use a joystick to select any of six departments: the Banner, the Photo Lab, the Copy Desk, Layout, the Press, or the Wire Service.



Photos are created in the Photo Lab and then are combined with text written at the Copy Desk to make a panel. As with most desktop publishers, once you've placed a graphic on a panel, the text you add automatically wraps around it. If you later decide to move the picture, just drag it to a new position, and the text still flows around it.

The Newsroom provides five fonts in small and large sizes. Select the size and style you want, move to a panel, and begin typing. You enter headlines and text directly rather than from a word processor. The work area on the screen represents one panel. If a panel fills, save it and continue writing on another. When you have enough panels to fill a page, send them to Layout and arrange them in order; then it's off to the Press—your dot-matrix printer.

By selecting the Wire Service, you can send or receive panels, photos, banners, or complete publications via telephone and your computer's modem. Newsletter reporters and artists can upload finished panels to their editor as deadlines approach. Every contributor doesn't have to use the same type of computer as long as each person has a copy of *The Newsroom*—for example, the reporter could use an IBM, the artist could work on an Apple, and the editor could lay out and print the finished product on a 64 or 128.

The Newsroom comes with a disk filled with more than 600 pieces of clip art that are quick and easy to use. If you need more, Springboard offers two additional volumes of clip art. The ease with which *The Newsroom* handles graphics is a key ingredient to making this program a pleasure to use.

He added that a pasted-up page could easily be lost or damaged, making reprints difficult. Desktop publishing allows Heaney to access a disk and print back issues of the newsletter at any time.

The Newsroom also saves the MACE editor's time. Heaney creates a format for each page and only changes the contents each month. "I don't see the need to get too fancy with it," he notes.

For *GEOS* Users

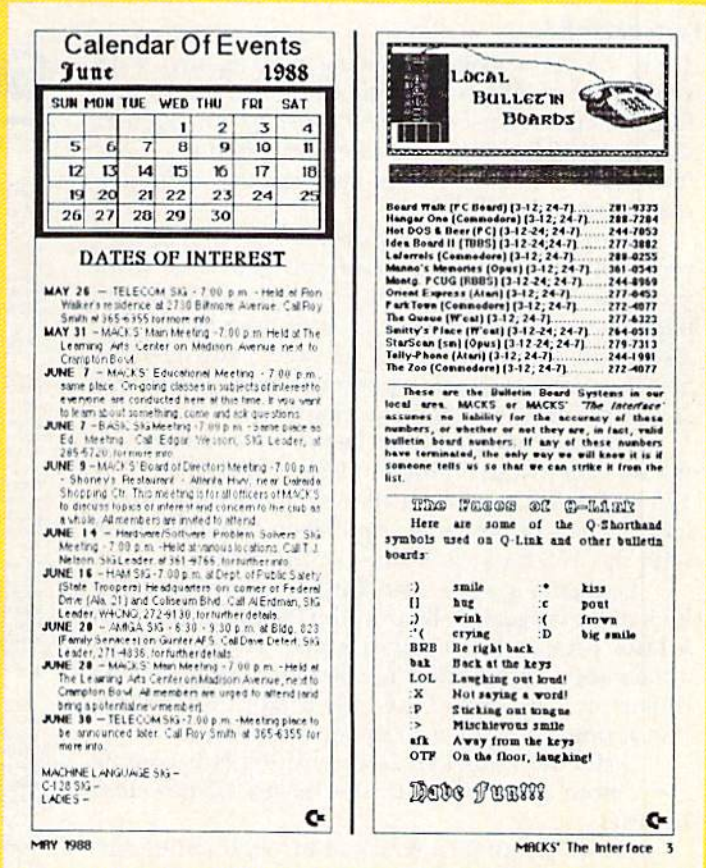
Another desktop publishing program gaining in popularity is *geoPublish* from Berkeley Softworks, designed to operate with *GEOS*.

"I don't see how I did without it," says Rodney Gill, *geoPublish* user and editor of "The Interface," a newsletter for the Montgomery Area Commodore Komputer Society in Montgomery, Alabama. "I like the way *GEOS* operates."

Gill uses *geoPublish* to convert the club members' articles from several different word processing and graphics formats. After conversion, he creates a template and moves the articles into it.

Before *geoPublish*, Gill usually had to wait until all of the articles for the newsletter were submitted before he could begin to paste up the pages. This sometimes required working late into the night in order to get the newsletter to the printer on time.

"I can now do the newsletter as the articles come in and print it out a page at a time," he says. "Now the complete newsletter is finished just a couple of days after deadline."



Calendar Of Events

June 1988

SUN	MON	TUE	WED	THU	FRI	SAT
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30		

DATES OF INTEREST

MAY 26 – TELECOM SIG - 7:00 p.m. - Held at Ron Walker's residence at 2730 Biltmore Avenue. Call Roy Smith at 365-4355 for more info.

MAY 31 – MACK'S' Main Meeting - 7:00 p.m. Held at The Learning Arts Center on Madison Avenue next to Crompton Blvd.

JUNE 7 – MACK'S' Educational Meeting - 7:00 p.m., same place. On-going classes in subjects of interest to everyone are conducted here at this time. If you want to learn about something, come and ask questions.

JUNE 7 – BASIC SIG Meeting - 7:00 p.m. - same place as Ed. Meeting. Call Edgar Wesson, SIG Leader, at 265-4732 for more info.

JUNE 9 – MACK'S' Board of Directors Meeting - 7:00 p.m. - Shoney's Restaurant - Alberta Hwy. near Eastgate Shopping Ctr. This meeting is for all officers of MACK'S to discuss topics of interest and concern to the club as a whole. All members are invited to attend.

JUNE 14 – Hardware/Software Problem Solvers SIG Meeting - 7:00 p.m. - Held at various locations. Call T.J. Nelson, SIG Leader, at 361-4766 for further info.

JUNE 16 – HAM SIG - 7:00 p.m. at Dept. of Public Safety (State Troopers) headquarters on corner of Federal Drive (Ala. 21) and Coliseum Blvd. Call Al Erdman, SIG Leader, WHONG, 272-9130, for further details.

JUNE 20 – AMIGA SIG - 6:30 - 9:30 p.m. at Bldg. 823 (Family Services) on Gunter AFS. Call Dave Detert, SIG Leader, 271-4836, for further details.

JUNE 28 – MACK'S' Main Meeting - 7:00 p.m. - Held at The Learning Arts Center on Madison Avenue, next to Crompton Blvd. All members are urged to attend (and bring a potential new member).

JUNE 30 – TELECOM SIG - 7:00 p.m. - Meeting place to be announced later. Call Roy Smith at 365-4355 for more info.

MACHINE LANGUAGE SIG –
C-128 SIG –
LADIES –

MAY 1988

LOCAL BULLETIN BOARDS

Board Walk (PC Board) (3-12; 24-7)	281-9335
Hangar One (Commodore) (3-12; 24-7)	288-7284
Hot DOS & Beer (PC) (3-12-24; 24-7)	244-7053
Idea Board II (PBBS) (3-12-24;24-7)	277-3882
LaTorrels (Commodore) (3-12; 24-7)	288-0255
Munn's Memories (Opus) (3-12; 24-7)	361-0543
Montg. PCUG (RBBS) (3-12-24; 24-7)	244-8969
Orient Express (Atari) (3-12; 24-7)	277-6453
ParkTown (Commodore) (3-12; 24-7)	272-4077
The Queue (W'east) (3-12; 24-7)	277-6323
Smitty's Place (W'east) (3-12-24; 24-7)	264-0513
StarScan (sm) (Opus) (3-12-24; 24-7)	279-7313
Telly-Phone (Atari) (3-12; 24-7)	244-1981
The Zoo (Commodore) (3-12; 24-7)	272-4077

These are the Bulletin Board Systems in our local area. MACKS or MACKS' *"The Interface"* assumes no liability for the accuracy of these numbers, or whether or not they are, in fact, valid bulletin board numbers. If any of these numbers have terminated, the only way we will know it is if someone tells us so that we can strike it from the list.

The Faces of Q-Link

Here are some of the Q-Shorthand symbols used on Q-Link and other bulletin boards:

:)	smile	:*	kiss
[]	hug	:c	pout
;)	wink	:(	frown
:'(	crying	:D	big smile
BRB	Be right back		
bak	Back at the keys		
LOL	Laughing out loud!		
:X	Not saying a word!		
:P	Sticking out tongue		
:>	Mischievous smile		
afk	Away from the keys		
OTF	On the floor, laughing!		

Have Fun!!!

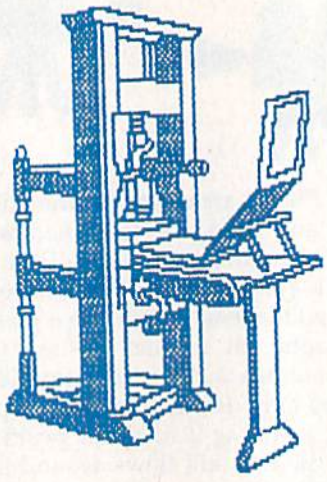
MACKS' The Interface 3

geoPublish

Berkeley Software offers *geoPublish* ($49.95), a full-featured desktop publishing program that operates with *GEOS*. As with most *GEOS* applications, be prepared to spend some time transferring files—making work disks and backup copies before you actually start to work. A second disk drive or a RAM-expansion unit makes copying files easier and greatly increases the operating speed of *geoPublish*.

The first step in creating a document with *geoPublish* is building the master page. This is where you establish your publication's basic look. If you're putting together a newsletter, the master front page might include a banner across the top, the issue number, and perhaps the date. Inside master pages might have a line across the top and bottom, the newsletter's name in a smaller font, and page numbers. Saving master pages will speed the layout of future editions of your newsletter.

A master-page work screen has rulers across the top and side to help you position the program's guidelines. Guidelines are dashed horizontal and vertical lines that delineate columns. These lines appear on the screen as guides for exact placement of text, headlines, and graphics, but they don't show on the printout. You can create as



many as 16 master pages, ranging in width from one to four columns. The *geoPublish* disk contains a library of sample master pages to get you started.

Once you've created a master page, it's time to start laying out text and graphics. *geoPublish* takes files written with geoWrite and converts them into the fonts you want and sets the type in the column widths you specify.

If your text isn't written with geoWrite, the Text Grabber utility converts almost any Commodore word processor file to geoWrite format. If you're editing a newsletter, you can use articles from several writers using a variety of word processors without having to retype their submissions. Edit mode then lets you make text changes once you have converted the file to a *geoPublish* document.

To write original headlines or to incorporate graphics, switch to the page graphics mode. A graphic can be centered, stretched, or scaled to fit any region you define on your page. A toolbox lets you add lines, circles, polygons, or other shapes to customize your layout. You can also fill them, move them, and even place one object in front of another. This powerful mode gives you a wide selection of customizing tools and commands to fine-tune your layout.

Geoworld

There's even a magazine being put together with *geoPublish*. Self-proclaimed Commodore fanatic Roger Ledbetter also uses *geoPublish* to put together *Geoworld* (38 Santa Ynez Street, Santa Barbara, California 93103), which bills itself as the definitive magazine about *GEOS*.

Prior to the availability of *geoPublish*, Ledbetter produced the magazine with the geoWrite word processor and geoPaint, using overlays to create the page layout. "It took quite a bit of time to do that, along with the paste work," he says. "The overlays also required a lot of experimentation. *geoPublish* saves me about ten hours a month."

The only problem that Ledbetter encounters is the 64's hardware limitation: lack of disk space. "A 128 with RAM expansion allows it *[geoPublish]* to be used to its full potential. I prefer to use *geoPublish* with the 128 because it doesn't cramp you."

Ledbetter goes a step further to improve the look of his magazine. By printing the magazine with a laser printer, he achieves a near-typeset-quality appearance. "Nine out of ten people couldn't tell the difference," he said. "The only major difference is that it doesn't do as well in small typefaces."

Ledbetter adds that laser printing is becoming even more attractive with the release of new font libraries.

(Laser printing is available through online services such as QuantumLink. Newsletters, résumés, manuscripts, and so on can be uploaded to a print-

GEOPUBLISH GRAPHICS newsletter

By Susan Lamb — March, 1988

The Paint Drivers With GeoPublish

It has come to my attention that a number of people are under the impression that the paint drivers do not work with geoPublish. Fortunately, for my projects, they do. Turning a geoPublish page into a geoPaint one lets you use all the individual tools of each program. If you are having trouble getting the drivers to work, you might try these two suggestions.

1. **Give it time.** Depending on the amount of information on the page, creating the geoPaint page may take a long time. There is no sound if you are working on a RAM disk and it sometimes seems like a lock-up. The arrow will flicker once in a while, which indicates the process is still working.

2. **Give it space.** Before you start, make sure there is plenty of space on the real disk or RAM disk. For example, a geoWrite page of only 3K can produce a geoPaint page of 37K. Obviously, multi-page documents with a large amount of type will really eat up disk space.

Experimenting with the programs will let you estimate how much room to allow for.

12

GeoWrite Workshop Paint Drivers

Last month I touched on how the paint drivers can aid in using large, two-file fonts. GeoWrite allows you to alternate between the files within a line, whereas a geoPaint text box can only access one file at a time. Once a headline is *set* to your satisfaction, and one of the paint drivers is selected, a geoPaint document will be created. The headline may then be edited with all the geoPaint tools and pixel editor imported as-is to geoPublish in a photo scrap.

When using *paint PAGES*, the document created is named *PAGE 1*. If your geoWrite document has more pages, *PAGE 2*, and so on will appear on the desktop. Before starting this procedure, make sure you have plenty of free space on the real disk or RAM disk as geoPaint pages use much more memory than geoWrite pages.

Creating with the *paint PAGES* driver is like producing photo scraps in that the new one replaces the old. To save a page you've made, rename the file before using the driver again. It is not necessary to have geoPaint on the disk to use the driver, but you must have geoWrite (or geoPublish) there. For speed & space, the best way to do this procedure is with a 1571 RAM disk.

Paint OVERLAY can be used several ways. A good example is to print the three-page document, "CAKE". The driver will combine all three pages into one geoPaint page. It is apparent that this would be an easy way to produce a simple newsletter. (*Paint PAGES* creates three geoPaint pages from this document.) The geoPaint file created is named *OVERLAY*. Another procedure is used for creating flyers, menus or certificates. You can name a full page border "OVERLAY" and then use the driver with a geoWrite page. The copy will combine, transparently, with the artwork. It will take some figuring with margins to fit the copy properly, but it's still a simple procedure.

I will continue to experiment with these drivers, as I find them valuable graphics tools. Receiving them with *geoWrite Workshop 128*, took the sting out of the cost of this upgrade.

WARNING:

Since a geoPublish page is a little longer than a geoPaint one, be careful when you use the paint drivers. The bottom 1/2 inch or so on your geoPublish page will be cut off, so allow for the difference ahead of time.

ENTER THE GEOS DESKTOP PUBLISHING CONTEST!

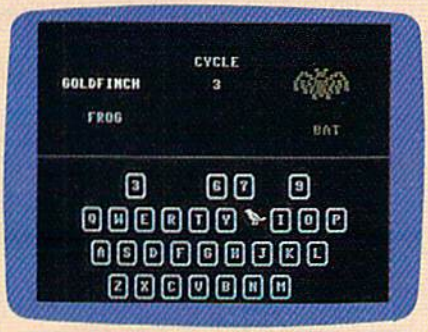
I will be happy to assist you with your entries. Although I am still new using this program I might be able to help with simple problems or direct you to someone who has answers to the more technical questions.

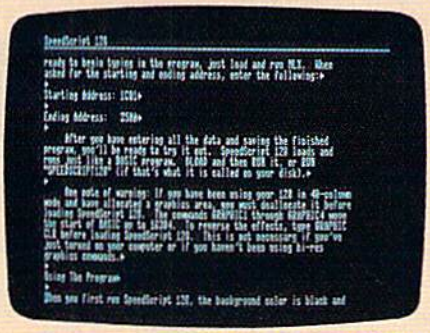
CORRECTION:

It has been brought to my attention by J. Hastings and Paul Hughes that my prior assertion of the 128 photo manager not working in geoPublish is wrong. My mistake was due to the frustrating incompatability of my 64 programs with my GEOS 128. All my programs are compatible now and a full page created in geoPaint can be moved to geoPublish in five photo scraps. You still must use geoPaint 128 in 80 columns to create the full-page-wide scraps to store in an album. From within geoPublish, you may use either 64 or 128 photo manager to create the bitmaps. Thanks, guys.

BUILT FOR SPEED

Now Get Inside Your Commodore with *COMPUTE!'s Gazette Disk.*





Now there's a way to get all the exciting, fun-filled programs of ***COMPUTE!'s Gazette***—already on disk—with ***COMPUTE!'s Gazette Disk.***

Subscribe today, and month after month you'll get a new, fully-tested 5¼-inch floppy disk guaranteed to run on your Commodore 64, or Commodore 128 personal computer.

COMPUTE!'s Gazette Disk brings you all the latest, most challenging, most fascinating programs published in the corresponding issue of ***COMPUTE!'s Gazette.*** So instead of spending hours typing in each program, now all you do is insert the disk . . . and your programs load in seconds.

RESULT: You have hours more time to enjoy all those great programs which appear in ***COMPUTE!'s Gazette***—programs like SpeedScript 128, Arcade Volleyball, 3-D Sprites, Sketch Pad, Sound Manager, 1541 Speed and Alignment Tester, and hundreds more.

So don't waste another moment. Subscribe today to ***COMPUTE!'s Gazette Disk*** at this money-saving price. Take a full year's subscription for just $69.95. You save 55% off the single issue price. Subscribe for two years and save even more! Return the enclosed card now.

Individual issues of the *Disk* are available for $12.95 (plus $2.00 shipping and handling) by writing us at P.O. Box 5188 Greensboro, N.C. 27403.

DON'T SETTLE FOR LESS...

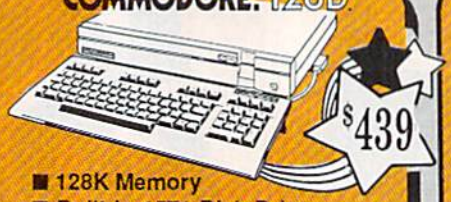
COMMODORE 64C

$149.95

1541II DISK DRIVE $169.95
1802C MONITOR $189.00

64C w/1541II Drive $309
1802C with either package $184

COMMODORE 128D



$439

- 128K Memory
- Built in 1571 Disk Drive
- Detatchable Keyboard

128D w/1084 Monitor.....$719
128D w/Samsung RGB Monitor $638

COMMODORE AMIGA

FOR ALL YOUR AMIGA NEEDS ... CALL tcp

512K RAM Upgrade..... $159
1010 EXT DRIVE $219
1680 MODEM $139

TUSSEY'S SPECIAL PACKAGES

GAME GALLERY

Educational Software too!
All Games stocked for quick ship!!!

SUMMER SOFTWARE SAVINGS

ACCESS
Echelon $27.95
Leader Board $22.95
Leader Board Tourn. Disk $13.95

ACCOLADE
Apollo 18 .....$19.95
Comics $19.95
4th & Inches $19.95
Hard Ball $19.95
Killed Until Dead $12.95
Miniputt $19.95
Test Drive $19.95

ACTIONSOFT
Thunder Chopper $19.95
Up Periscope $17.95

ACTIVISION ENTERTAINMENT SOFTWARE
Air Rally $19.95
Aliens $22.95
Gamemaker Package with all Librarys $39.95
Last Ninja $22.95
Maniac Mansion $24.95
Music Studio $19.95
Shanghai $19.95

AVALON HILL
NBA $27.95

BRODERBUND
Lode Runner $22.95
Moebius $27.95
Superbike Challenge $14.95
Ultima V $39.95

CINEMAWARE
Defender of the Crown $22.95
King of Chicago $32.95
SDI $27.95
The Three Stooges $27.95

COSMI
Def Con 5 .....$17.95

DATA EAST
Commando $14.95
Karate Champ $14.95
Kid Niki $19.95
Platoon $19.95
Speed Buggy $17.95

Datasoft
Alt Reality/Dungeon $27.95
Hunt For Red October $27.95
Video Title Shop $19.95

Digital Solutions Inc.
Pocket Writer 2 .....$39.95
Pocket Filer 2 .....$37.95
Pocket Planner 2 .....$37.95
Digital Superpak $64.95
Dictionary $12.95

ELECTRONIC ARTS
Bard's Tale $24.95
Bard's Tale II $27.95
Bard's Tale III $24.95
Chessmaster 2000 .....$26.95
Demon Stalkers $19.95
Dragon's Lair $19.95
EOS(Erth Orbit Stat'n) $19.95
Instant Music $22.95
Legacy of the Ancients $19.95
Marble Madness $19.95
Master Ninja $24.95
Monopoly $24.95
Outrageous Pages $34.95
PHM Pegasus $19.95
Roadwars $24.95
Rockford $22.95
Skate or Die $19.95
Sky Fox II $19.95
Strike Fleet $19.95
Wasteland .....$CALL
World Tour Golf $19.95
Yeager AFT $24.95

EPYX
500 XJ Joystick $14.95
California Games $24.95
Champ'ship Wrestling $14.95
Create a Calendar $17.95
Destroyer $22.95
4x4 Off-Road Racing .$24.95
Impossible Mission $24.95
L. A. Crackdown $24.95
Movie Monster $12.95
Street Sports Baseball $24.95
St Sports Basketball ...$24.95
Street Sports Soccer ..$24.95
Sub Battle $22.95
Summer Games $14.95
Summer Games II $14.95
Winter Games $14.95
World Games $24.95

FIREBIRD
Elite $17.95
Guild of Thieves $22.95
Knight ORC $24.95
Star Glider $24.95
The Sentry $24.95

GAMESTAR
Championship Football $24.95
GBA Basketball 2 on 2 .....$22.95
Top Fuel Eliminator $17.95

INFOCOM
Beyond Zork $26.95
Hitchhiker's Guide $14.95

LANCE HAFNER for the best in sports strategy simulation
3 in 1 Football $29.95
Bktball, the Pro Game .$29.95
Final Four Basketball ...$29.95
Full Count Baseball $29.95

MICROLEAGUE
Baseball $24.95
Wrestling $19.95

MICRO PROSE
Airborne Rangers $24.95
F-15 Strike Eagle $21.95
Gunship $21.95
Kennedy Approach $14.95
NATO Commander $22.95
Pirates $23.95
Silent Service $21.95
Solo Flight $14.95
Stealth Fighter $24.95

MINDSCAPE
Gauntlet $24.95
Indoor Sports $19.95
Infiltrator II $19.95
Paperboy $22.95
Perfect Score:SAT prep ...$44.95
Superstar Hockey $22.95

SIMON & SHUSTER
Star Trek: Promethian Adv $24.95
Typing Tutor IV $24.95

SPECTRUM HOLOBYTE
Falcon $22.95
Intrigue $19.95
PT 109 .....$24.95
Soko Ban $17.95

SOFTWARE SIMULAT'NS
Football $19.95
Pure Stat Baseball $24.95
Pure Stat College BB $24.95

SSI
Advanced Dungeon & Dragons $24.95
B-24 .....$22.95
Eternal Dagger $24.95
Phantasie I, III (each) $24.95
Rings of Zilfin $24.95
Roadwar Europa $24.95
Shard of Spring $24.95
Wargame Const Set $19.95

SUBLOGIC
Flight Simulator II $32.95
Jet $27.95
Stealth Mission $34.95

64C BUSINESS AND PRODUCTIVITY

64C DATABASES
Bank Street Filer $24.95
Data Manager II $19.95

64C INTEGRATED PKGS
Vizastar 64 4K $24.95

64C SPREADSHEETS
Swiftcalc 64 w/sideways ..$17.95
Sideways $14.95

64C WORD PROCESSORS
Bank Street Writer $29.95
Font Master II $29.95
Paperclip w/spellpack $32.95
Paperclip III $39.95
Pocket Writer Dictionary ..$12.95
Word Writer III $34.95

FINANCIAL & ACCT.
Timewks Electr. Checkbk .$17.95
Timeworks Money Mgr $17.95
CMS Acct Pkg/64 .....$119.95

MISC. HARDWARE
Estes pwr supply for C-64 $54.95
Naverone 3 Slot expder ...$24.95

UTILITIES
Thinking Cap $24.95
Toy Shop $24.95
Copy II 64/128 .....$24.00
Fast Load $24.95
Bobs Term Pro $32.95

WICO JOYSTICKS
The Boss $12.95
Bat Handle $17.95
3-Way $22.95

COMMODORE 128 SOFTWARE

WORD PROCESSORS
Fleet System 4 .....$49.95
Font Master 128 .....$39.95
Paperclip II $54.95
Paperclip III $39.95
Superscript 128 .....$44.95
Term Paper Writer $29.95
Wrdwriter 128 w/spell .$34.95

SPREADSHEETS
Swiftcalc 128 w/sdwys $39.95

DATA BASES
Data Manager 128 .....$34.95
Perfect Filer $44.95
Superbase 128 .....$49.95

MISC. 128 SOFTWARE
Accountant Inc $59.95
CMS Acct Pkg/128 ...$124.95
Mach 128 .....$34.95
Partner 128 .....$39.95
Sylvia Porter's Personal Finance Planner $44.95

GRAPHICS CORNER

Batteries Included
Paperclip Publisher $39.95

Berkeley Softworks
GEO Publish $44.95

Broderbund
Graphics Library I,II or III ..$16.95
Print Shop $25.95

Electronics Arts
Outrageous Pages $34.95

Springboard
Certificate Maker $29.95
Clip Art I or III $19.95
Newsroom $19.95

Timeworks
Desktop Publisher $39.95

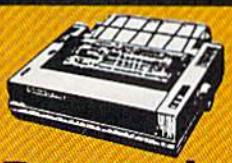
Unison World
Printmaster Plus $24.95

tcp TUSSEY COMPUTER PRODUCTS

P.O.BOX 1006, STATE COLLEGE, PA 16804

...tcp SHIPS IT

PRINTERS



Panasonic Office Automation

2 yr warranty

1080iII $164.95
1091iII $199.00
1092i $319.00

star micronics inc

NX-1000
(144 draft/36 NLQ) ...$169.95
NX 1000 Rainbow
(color printer) $229.95
NX-1000C
(Commodore Int'face) $174.95
NX-1000C Rainbow
(Commodore Interface/
Color Printer) $229.95

SEIKOSHA

2 yr warranty

SP-180 VC $139.00
SP-1200 VC....$CALL
SP-1200 AI ...$169.00
120cps, NLQ Mode

CITIZEN

120D $169.95
180D .....$CALL
MSP-40 .....$319.95
Tribute 224 .....$679.95

OKIDATA 180

$229

- Built in COMMODORE* and EPSON* Interface
- 180 CPS Print Speed

Call For Other Okidata Printers

COMMODORE AMIGA

FOR ALL YOUR AMIGA NEEDS ... CALL tcp

AMIGA SOFTWARE

PRODUCTIVITY

Deluxe Music Const Set	$79.95	Logistix	$89.00
Deluxe Paint II	$99.95	Superbase	$89.00
Deluxe Print II	$59.95	Vizawrite	$89.00
Deluxe Video 1.2	$99.95	Word Perfect	$CALL
Draw Plus	$189.00		

ENTERTAINMENT

Balance of Power	$29.95	Hot-Cold Jazz	$24.95
Bards Tale	$39.95	Leisure Suit Larry	$44.95
Beyond Zork	$37.95	Marble Madness	$32.95
Chessmaster 2000	$29.95	Racter	$27.95
Defender of the Crown	$29.95	S.D.I.	$29.95
Deja Vu	$29.95	Silent Service	$29.95
Earl Weaver Baseball	$39.95	Sinbad	$29.95
Ferrari Formula One	$32.95	Starfleet I	$39.95
Flight Simulator II	$39.95	Univited	$29.95
Halley Project	$29.95		

512K RAM Upgrade.. $159.00
1010 EXT DRIVE $219.00
1680 MODEM $139.00

NEW LOWER PRICES !!

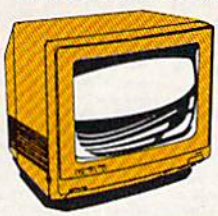
SUPER GRAPHIX JR
Printer Interface $32.95
w/Printer from Tussey $29.95

SUPER GRAPHIX
Interface w/8K buffer
down loadable fonts $54.95
w/Printer from Tussey $49.95

SUPER GRAPHIX GOLD .$94.95
w/Printer from Tussey $84.95

Xetec

RGB/COMPOSITE COLOR MONITORS FOR THE 128



COMMODORE 1084
640 x 400 Resolution.
4 Operating Modes
.....$299.00

MAGNAVOX 8762
640 x 240 Resolution.
3 Modes. 1 yr warranty
.....$249.00

THOMSON 4120
560 x 240 Resolution.
4 Modes.1 yr warranty
.....$219.00

All 3 monitors include cables to Commodore 128

Berkeley Softworks

GEO PUBLISH (64/128) $44.95

GEOS 128	$44.95	GEOS	$36.95
Geo Calc 128	$44.95	Geo Calc	$31.95
Geo File 128	$44.95	Geo File	$31.95
Geo Programmer	$47.95	Geodex	$24.95
Geo Publish	$44.95	Deskpack	$21.95
Geo Write 128	$44.95	Fontpack	$19.95
Geo Spell	$22.95	Geo Write	$31.95

FEDERAL EXPRESS

Software orders over $100 and Accessories under 6 pounds will be shipped Federal Express

(Even at these prices) You only pay TCP's standard shipping charge of $4.00 per order. Orders arriving before 3:00 PM our time will be shipped out same day. If part of your order is backordered the remainder will be shipped UPS Ground FREE!

SECURITY
- Your Credit Card is not charged until your order is shipped.
- We insure your order at no extra cost to you.
- Tussey is a financially strong and well established company.

CUSTOMER SUPPORT
- After sales support.
- Knowledgeable staff, all graduates of Tussey's "Computer Boot Camp".
- Our advanced warehouse/materials handling system assures your order is shipped out accurately & on time.
- Our IBM 5360 allows instant order and inventory status.

To order by mail: We accept money order, certified check, personal check. Allow 2 weeks for personal & company checks to clear. **Shipping:** $4.00 for software FOR ALL HARDWARE AND ANY ACCESSORY OVER 6lbs Call our Toll Free Number 1-800-468-9044 for shipping charges. Add $3.00 per box shipped COD. Additional shipping required on APO, FPO, AK, HI, and foreign orders. **Terms: PRICES REFLECT CASH DISCOUNT, ADD 1.9% FOR MASTERCARD OR VISA.**
ALL SALES ARE FINAL
Defective items replaced or repaired at our discretion. Pennsylvania residents add 6% sales tax. Prices and terms subject to change without notice.

VISA MasterCard

NEW
SAMSUNG
RGB MONITOR
- 14" Anti-Glare Screen
- 640 x 240 Resolution
- Tilt/Swivel

only $219

Panasonic Office Automation

1080iII Printer
- 144 cps (draft)
- NLQ Mode
- 2 yr Warranty

$164.95

C= COMMODORE
1670 MODEM
$79

C= COMMODORE
1764
256K RAM EXPANSION
$119

C= COMMODORE
1581
3 1/2" DISK DRIVE
$197

CMS

ACCOUNTING SYSTEMS
Pkg. Price for all Modules:
C128 version $124.95
C64 version $119.95

DISK-KOUNTS

per box of 10		3.5"	5.25"
BONUS	DS DD	$16.95	$6.95
MAXELL	DS DD	$17.95	$9.95
VERBATIM	DS DD	$19.95	$9.95
SONY	DS DD	$16.95	$8.95

Regular Hrs: 8:00AM-9:00PM Mon-Fri, 10:00AM-6:00PM Sat, 12:00PM-8:00PM EST

CALL TOLL FREE 1-800-468-9044

tcp

FOR INFORMATION CALL 814-234-2236 FAX: 814-237-4450

If you have Berkeley's *Desk Pack 1*, you can use its Graphics Grabber utility to import graphics from *Print Shop*, *Newsroom*, and *PrintMaster*.

Personal Newsletter

Personal Newsletter ($49.95), from Softsync, comes with two disks: the Master, which contains sample newsletters and 70 pieces of clip art, and a Clip Art Disk filled with an additional 200 business and miscellaneous drawings.

Softsync's *Personal Newsletter* ($49.95) isn't a stand-alone program, but is designed to be used with *GEOS*. If you're already familiar with geoPaint and geoWrite, then you should have no trouble learning to use *Personal Newsletter*. You can use a joystick, mouse, graphics pad, or lightpen as an input device, just as you would with other *GEOS* applications.

After booting with *GEOS*, you should make several *Personal Newsletter* work disks before you begin your newsletter. When you're ready to start, a basic work screen appears with rulers across the top and down the left side of the screen. These help you lay out and align the "windows" you create for your text and graphics. As many as 20 windows can be used on a single page.

As with all newsletters, it's best to sketch a basic layout on paper before you sit down at the computer.

Once you've blocked out the number of columns you want and where you want your graphics, define similar windows on the screen. Stretch these windows to any size and move them to duplicate the layout you made on paper.

When you're ready to enter text, you can use any of the fonts offered with geoWrite, or you can import others if you have *Fontpack*. Click on the font window at the top of the screen, and a list of fonts and their point sizes appears. Click on your choices and then move to the desired window and start typing. *Personal Newsletter* wraps text automatically to fit your window. It also wraps text around graphics. In addition, it lets you select italics, bold, underlined, or reversed type styles.

The work screen is 80 columns wide, so you'll have to scroll to see your whole page. A handy preview feature shrinks the page so you can see how your layout looks as your work progresses. Once you've created a few windows, it's best to check your design. Windows are easier to change and move before you fill them with text and graphics.

You can design your own graphics with geoPaint, use the clip art that comes with *Personal Newsletter*, or import *Print Shop* graphics. You can even use digitized art if you have a video camera and a digitizer such as ComputerEyes. *Personal Newsletter* comes with three utility programs you can use to import and customize existing graphics.

When it comes time to print, click on the print menu and confirm it by clicking on the OK block. Be sure you've installed the *GEOS* driver for your printer on your work disk.

ing company, printed, and mailed back to you within a few days.)

New Kid on the Block

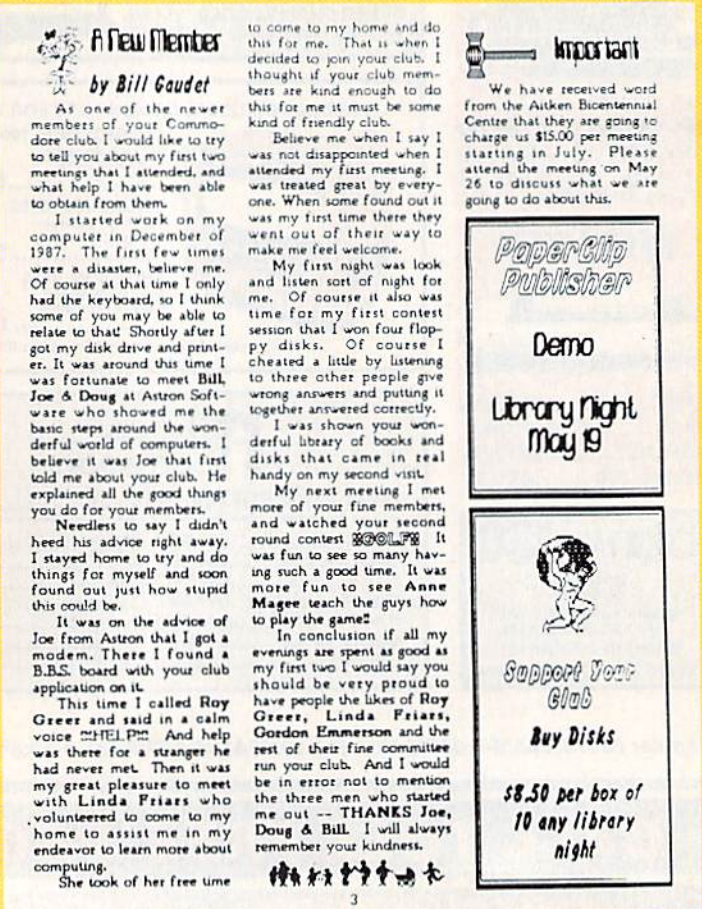
One of the newest desktop publishing programs on the market is Electronic Arts' *PaperClip Publisher*. FORCE, (the Fundy Organization foR Commodore Enjoyment) in Saint John, New Brunswick, Canada, has acquired *PaperClip Publisher* to produce its newsletter, "The Users Port."

"It's very flexible, easy to use, and can handle a wide variety of graphics," says Anne Magee, who publishes the newsletter. She notes that it didn't take her long to do paste-up before using *PaperClip Publisher*, but she never attempted anything fancy.

"It takes longer to do [with *PaperClip Publisher*], but it looks much better," she says. "If I were still pasting it up and tried to make it look like it does now, it would take even longer."

Magee likes the way the program converts files downloaded from bulletin board services or from most word processing programs. While the program can be operated with a joystick, Magee finds smoother control is achieved through the use of a mouse.

Like her colleagues, she has learned to live with the 64's limitations. "It's slow and requires a lot of disk access," she says. Nonetheless, Magee is pleased with the results she achieves. "It is amazing to do this with a 64. A few years ago, it would've seemed impossible."



A New Member

by Bill Gaudet

As one of the newer members of your Commodore club, I would like to try to tell you about my first two meetings that I attended, and what help I have been able to obtain from them.

I started work on my computer in December of 1987. The first few times were a disaster, believe me. Of course at that time I only had the keyboard, so I think some of you may be able to relate to that. Shortly after I got my disk drive and printer. It was around this time I was fortunate to meet **Bill, Joe & Doug** at Astron Software who showed me the basic steps around the wonderful world of computers. I believe it was Joe that first told me about your club. He explained all the good things you do for your members.

Needless to say I didn't heed his advice right away. I stayed home to try and do things for myself and soon found out just how stupid this could be.

It was on the advice of Joe from Astron that I got a modem. There I found a B.B.S. board with your club application on it.

This time I called **Roy Greer** and said in a calm voice "HELP!!!" And help was there for a stranger he had never met. Then it was my great pleasure to meet with **Linda Friars** who volunteered to come to my home to assist me in my endeavor to learn more about computing.

She took of her free time to come to my home and do this for me. That is when I decided to join your club. I thought if your club members are kind enough to do this for me it must be some kind of friendly club.

Believe me when I say I was not disappointed when I attended my first meeting. I was treated great by everyone. When some found out it was my first time there they went out of their way to make me feel welcome.

My first night was look and listen sort of night for me. Of course it also was time for my first contest session that I won four floppy disks. Of course I cheated a little by listening to three other people give wrong answers and putting it together answered correctly.

I was shown your wonderful library of books and disks that came in real handy on my second visit.

My next meeting I met more of your fine members, and watched your second round contest **XGOLFS** It was fun to see so many having such a good time. It was more fun to see **Anne Magee** teach the guys how to play the game!

In conclusion if all my evenings are spent as good as my first two I would say you should be very proud to have people the likes of **Roy Greer, Linda Friars, Gordon Emmerson** and the rest of their fine committee run your club. And I would be in error not to mention the three men who started me out -- **THANKS Joe, Doug & Bill.** I will always remember your kindness.

3

Important

We have received word from the Aitken Bicentennial Centre that they are going to charge us $15.00 per meeting starting in July. Please attend the meeting on May 26 to discuss what we are going to do about this.

PaperClip Publisher

Demo

Library Night May 19

Support Your Club

Buy Disks

$8.50 per box of 10 any library night

PaperClip Publisher

Outrageous Pages was Electronic Arts' desktop publishing entry, but it was discontinued when *PaperClip Publisher* was released. For the price ($49.95) and the number of sophisticated features it offers, this publishing program is hard to beat.

Its work screen is similar to that of other publishing programs in that rulers at the top and side of the screen help you accurately position columns, headlines, and graphics.

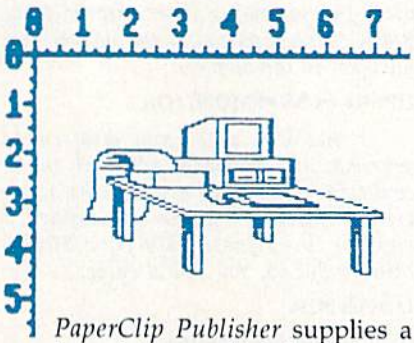
Eighteen icons on the right of the screen represent tools that give you exceptional control of your layout. Simply move the cursor with a joystick or mouse and then click on an icon to activate it. When it comes to designing a layout, you can have as many as 15 columns of text on one page.

Once you've laid out your page, draw a box where you want the copy to appear and "pour" in the text from a number of word processors. Text flows into the box in a process that resembles the way the fill command works on drawing programs. You can link several boxes together on the same or different pages if you need more space for your text. *PaperClip Publisher* accommodates documents ranging in length to a maximum of 50 pages. You can convert word processing files from the *PaperClip* series, *Bank Street Writer*, *Word Writer*, or *PaperBack Writer*.

A straightforward text editor lets you create text right on the page if you prefer to type text directly. Don't worry about the format as you enter text. If a word breaks at the end of a line, don't change it. It will be formatted properly when you pour the copy into a text box. The editor includes a handy *find* function that will search a document for a specific string. You can embed as many as 13 different style codes in a document to put words in italics, underline them, reverse them, or have them print out in subscript or superscript mode, to name a few options.

When laying out text, you can justify it, center it, or have it printed flush left or flush right. Another sophisticated feature lets you adjust the amount of *leading*, or space between lines. Such fine-tuning isn't normally found on programs in this price range.

PaperClip Publisher comes with its own limited supply of clip art, but you can draw your own or convert graphics files from *Print Shop*, *PrintMaster*, *Outrageous Pages*, and *DOODLE!*. The manual notes that you can use graphics from *The Newsroom*, but the file converter apparently cannot read *The Newsroom* directory. You can change the size of graphics, expanding or shrinking them to fit your layout, and a graphics editor lets you draw your own. You can modify graphics, print in them reverse, or even turn them upside down.



PaperClip Publisher supplies a number of clear, well-defined fonts, including a Greek-symbol font for use with scientific and mathematical expressions. There's even a Sideways font if you want to print text rotated 90 degrees. If you need more fonts, a converter program allows you to import them from *GEOS* or *Outrageous Pages*. Text can be printed in reverse, italics, bold, and other styles. It can even be printed upside down, which is useful for printing folded greeting cards.

Jazz up your layout with a variety of borders, textured backgrounds, transparent and opaque boxes, and drop-shadow effects. Most of these effects and special tools are available onscreen or from easy-to-use pull-down menus.

Drawbacks

While desktop publishers provide you with a number of powerful printing tools, they do have limitations. Even if your printer has a near-letter-quality mode, text printed on a nine-pin dot-matrix printer can't compete with the quality offered by commercial printers. For truly professional applications, you may hesitate to release work printed on a nine-pin.

A 24-pin printer is better, but none of the programs have drivers to support them. You may find a printer driver and interface combination that works with a 24-pin printer, but you'll have to experiment. The best results are available to desktop publishers who own or have access to a laser printer. You can use one to print *geoPublish* and *Personal Newsletter* documents since *GEOS* supports the Hewlett-Packard LaserJet printer. Online services such as QuantumLink can also give you access to laser-printing services.

Printing can also be rather slow, depending on which printer you have. One test page with several graphics took almost half an hour to print on a 1526. If you want to send copies of your newsletter to 100 members of your club, take your master copy to a duplicating machine or commercial printer for the other 99 copies. Actually, duplicating often improves the look of computer-printed documents by rendering the text darker.

As with any new skill, it takes time to master desktop publishing. Until you become completely familiar with each step of your publishing program, you may find it takes longer to create a newsletter on a computer than it does using conventional methods. Be prepared for a lot of disk swapping. This is especially true of the *GEOS*-based packages, with their numerous file- and graphic-handling utilities.

Finally, desktop publishing on your 64 or 128 may not turn you into a publishing magnate overnight, but these programs can put the power of the press in your hands even if you're on a shoestring budget. Then, who knows what will happen after your first edition hits the streets? Even Joseph Pulitzer had to start someplace.

The Newsroom
Springboard
7808 Creekridge Cir.
Minneapolis, MN 55435

geoPublish
Berkeley Softworks
2150 Shattuck Ave.
Berkeley, CA 94704

Personal Newsletter
Softsync
162 Madison Ave.
New York, NY 10016

PaperClip Publisher
Electronic Arts
1820 Gateway Dr.
San Mateo, CA 94404

Do you have a question or a problem? Have you discovered something that could help other Commodore users? We want to hear from you. Write to Gazette Feedback, COMPUTE!'s Gazette, P.O. Box 5406, Greensboro, NC 27403. We regret that, due to the volume of mail received, we cannot respond individually to programming questions.

Television, Computer Style

I have been wondering if there is any way that I can convert my Commodore 1702 monitor into a color TV. I'd still like to be able to use it as a monitor for my 64, too.

Jameson K. Dedon
Westfield, MA

Computer monitors closely resemble televisions, and the relationship between the two is more than skin deep. In fact, composite video monitors are little more than televisions with the television tuner removed.

Over the years, many companies have sold TV tuners specifically designed to turn color monitors into full television sets. The tuner is commonly a small box with a channel-selection dial. Tuners typically cost less than $100. Look for ads that frequently run in this magazine.

You may already have a tuner: your VCR. A computer monitor and VCR go together like hand and glove. Your VCR has a tuner, but no picture tube. Your monitor has a picture tube, but no tuner. To connect the two, you'll need a cable with two male RCA connectors. Plug one end into the composite output of your VCR, the other into the composite input on the front of your monitor. Change channels with the VCR tuner. If your 64 is hooked up through the rear connections of the monitor, you can easily switch between television and computer with the front/back selection switch on the back of the monitor.

128 ML Printouts

I have been looking for a screen-dump program that will allow me to print out hardcopies of my machine language monitor listings on the 128. Do you know of such a routine?

Jim Muller
Binghamton, NY

You don't need a special routine for this; the capability to redirect output to another device is built into all eight-bit Commodore computers. To disassemble to your printer rather than to the screen, just make the printer the current output device. The following line, entered from BASIC, directs output to the printer and puts you in the monitor:

OPEN4,4:CMD4:MONITOR

Henceforth, when you disassemble your machine language code (with the D command), the output is sent to the printer. For instance, suppose you wanted a copy of the disassembly from $0C00 through $0C36. You would enter

D 0C00 0C36

from within the monitor.

When you finished printing, you'd exit the monitor with X and then type

PRINT#4:CLOSE4

to restore output to the screen.

Alphabetizing a *SpeedScript* Name List

I am a beginning programmer who is having lots of problems. I'm trying to write a program to alphabetize a list of names. The names are kept in a *SpeedScript* file with their telephone numbers next to them. Can you suggest a way to do this?

Ken Davis
Baltimore, MD

The BASIC program below sorts a list of names stored in a SpeedScript *text file. It consists of three subroutines. The first, beginning at line 7000, reads in the* SPEEDSCRIPT *file. The second, at line 8000, performs a merge sort on the names. And the third, at line 9000, creates a* SPEEDSCRIPT *file containing the names in alphabetical order.*

```
SX 10 REM MX IS MAXIMUM ARRAY
      {SPACE}SIZE
MH 20 MX=15:DIM N$(MX),A(MX),B
      (MX)
CD 30 REM A$() IS ONLY NEEDED
      {SPACE}IF YOU WANT SORTE
      D STRINGS STORED IN AN A
      RRAY
JR 40 DIM A$(MX)
BA 50 GOSUB 7010:GOSUB 8010:GO
      SUB 9010:END
DQ 6999 REM
PF 7000 REM READ IN NAMES INTO
        N$ ARRAY
AF 7010 INPUT"ENTER NAME OF FI
        LE TO SORT";F$
KH 7020 OPEN 2,8,2,F$:NN=0
GK 7030 REM TWO BYTE FILE HEAD
        ER
CE 7040 GET#2,A$:GET#2,A$
JS 7050 GET#2,A$:IF ST<>0 THEN
         7110
DM 7060 REM 31 '<' IS CARRIAGE
         RETURN
XC 7070 T=ASC(A$+"@")
XJ 7080 IF T=31 THEN NA=NN+1:I
        F NN>MX THEN PRINT"ARR
        AY NOT LARGE ENOUGH":G
        OTO7120
GB 7090 N$(NN)=N$(NN)+A$:NN=NA
BR 7100 GOTO7050
RE 7110 N$(NN)=N$(NN)+CHR$(31)
HX 7120 CLOSE2:RETURN
QS 7999 REM
PM 8000 REM DO A MERGE SORT
DA 8001 REM CALL WITH STRINGS
        {SPACE}IN N$()
RR 8002 REM NN IS NUMBER OF ST
        RINGS
BJ 8003 REM SORTED POINTERS ST
        ORED IN B()
GJ 8010 IF NN=<0 THEN PRINT"NO
         NAMES HAVE BEEN LOADE
        D (NN)":RETURN
QE 8020 FOR I=0 TO NN:A(I)=I:N
        EXT
BA 8030 SIZE=1:A=0:PRINT"SORTI
        NG..."
MG 8040 P1=A:P2=A+SIZE:PB=A:MP
        =A+SIZE*2:IF MP>NN THE
        N MP=NN+1
KB 8050 IF P2>=MP THEN FOR I=P
        1 TO A+SIZE-1:B(PB)=A(
        I):PB=PB+1:NEXT:GOTO 8
        120
FM 8060 IF N$(A(P1))<N$(A(P2))
         THEN B(PB)=A(P1):P1=P
        1+1:PB=PB+1:GOTO 8100
AC 8070 B(PB)=A(P2):P2=P2+1:PB
        =PB+1
AC 8080 IF P2>=MP THEN FOR I=P
        1 TO A+SIZE-1:B(PB)=A(
        I):PB=PB+1:NEXT:GOTO 8
        120
MD 8090 GOTO 8060
CB 8100 IF P1>=A+SIZE THEN FOR
         I=P2 TO MP:B(PB)=A(I)
        :PB=PB+1:NEXT:GOTO 812
        0
ED 8110 GOTO 8060
SA 8120 A=A+SIZE*2:IF A>=NN TH
        EN 8140
JD 8130 GOTO 8040
XS 8140 FOR I=0 TO NN:A(I)=B(I
        ):NEXT
MQ 8150 SIZE=SIZE*2:IF SIZE>NN
         THEN 8180
JF 8160 A=0:GOTO 8040
MF 8170 REM REMOVE THE REM IN
        {SPACE}8180 TO PUT SOR
```

CHECK US OUT! LET US EARN YOUR BUSINESS!!

☑ SERVICE ☑ SUPPORT ☑ SELECTION ☑ PRICES ☑ GUARANTEE

HOME/BUSINESS

Bankstreet Writer		$35
9EST Business Series 64	EA	45
Business Form Shop		30
CMS Accountant 128		129
CMS Inventory 128		53
Chartpak 128 OR 64	EA	29
Datamanager 128		39
Datamanager 2		17
Fleet Filer 64/128		29
Fleet System 2 +		39
Fleet System 4		52
Fontmaster 128 w/Spell		39
Fontmaster II		35
KFS Accountant 128		119
Add-ons - call us		52
Math Function Evaluator		27
Microlawyer 64		42
PPM 128		42
PPM 64		29
Page Builder 128		39
Paperclip Publisher 64		39
Paperclip 3		39
Partner 128		39
Partner 64		30
Pocket Dictionary		10
Pocket Superpak 2		67
Pocket Write/File or Plan 2	EA	39
Securities Analyist 128		35
Superbase 128		49
Superbase 64		44
Superbase 128/1581 drive		**call
Swiftcalc 128 w/Sideways		39
Swiftcalc 64		17
TAS 128		42
TAS 64		29
Timeworks Business Series	EA	39
Vizistar 128		60
Viziwrite Classic 128		60
Wordwriter 128		39
Wordwriter 3		30

EDUCATIONAL

Body Transparent	22
Early Learning Friends/PRE	6
Facemaker/PRE	18
Galactic Frontier	22
Kindercomp/PRE	18
Stickybear ABC's/PRE	22
Stickybear Numbers/PRE	22
Stickybear Shapes/PRE	22
Alphabet Zoo/5-8	18

EDUCATIONAL

Easy Sign/5 +		$17
Grandma's House/5-9		6
Kids on Keys/5-8		18
Linkword Foreign Languages	EA	19
Little Computer People		$1
Peter Rabbit (Reading 1) / 5-8		19
Reader Rabbit/4-7		29
Rocky's Boots/9 +		29
Stickybear Math 1/5-8		22
Stickybear Reading/5-8		22
Stickybear Typing/5-8		22
Jungle Book (Reading 2) / 6-9		19
Kidwriter/6-9		22
Mathbusters/6-9		9
Stickybear Math 2/6-9		22
Stickybear Spellgrabber/6-9		22
Stickybear Townbuilder/6-9		22
First Men on Moon Math/9 +		19
Stickybear Read Compreh./9 +		22
Evelyn Wood Dynamic Read/11 +		17
Pro Tutor Accounting/14 +		69
R.S.V.P. / 12 +		21
Ticket to London, Paris, Span OR Washington/12 +	EA	21
Where USA Carmen		35
Where World Carmen		35
Widham Clasics / 10 + Alice In Wonderland, Swiss Family Robinson, Below The Root, Treasure Island OR Wizard of OZ	EA	12

PERSONAL

Bodylog Cardio Exercise		75
Bodylog Enhanced Stress		229
Bodylog Heartlab		49
Bodylog Muscle Development		54
Bodylog Standard Stress		89
Boston Bartender's Guide		12
Bridgemaster		12
Build a Book About You		19
CDA Cooking Titles		call
Crossword		12
Dr. Ruth's Sex		22
Dream Machine		19
Family Tree 128 OR 64	EA	39
Paul Whitehead Chess		25
RSVP		21
Sexual Edge		19
Tempo Typing		12

GEOS

Becker Basic		$35
Fontpac Plus 64/128		35
GEOS 128		45
GEOS 64		39
GEOS Companion Number One		24
GeoFile 64		35
GeoProgrammer		45
GeoPublish 64		45
GeoSpell		19
Geocalc 128		45
Geocalc 64		35
Geofile 128		45
Geowrite Workshop 128		45
Geowrite Workshop 64		35
Neofont		19
Word Publisher (GEOS)		28

GRAPHICS/CAD

3D Perspective 2		39
Advanced OCP Art Studio		25
Animation Station		65
BASIC 3		25
Billboard Maker		29
Blazing Paddles		25
Bumper Sticker Maker		35
Business Card Maker		35
CAD 3D		39
Cadpak 128		42
Cadpak 64		29
Certificate Maker		17
Colorez 128		12
Doodle!		29
Flexidraw 5.5		29
Geopublish 64		45
Graphic Art Disks 1 thru 10	EA	13
Graphic Label Wizard		21
Graphics Galleria Pak 1 OR 2	EA	24
Graphics Integrator 2		24
Graphics Transformer		25
Home Designer 128		45
ICON Factory		25
Moving Pictures		20
Newsroom		17
PCB Circuit Board Maker		79
Page Illustrator 128		29
Paperclip Publisher 64		39
Photo Finish		19
PrintMaster Plus		25
Printshop		35
Screen F/X		25
Slideshow Creator		13
The Toy Shop		22
Video Title Shop		25

AIDS/UTILITIES

1541/1571 Drive Alignment		$25
BASIC 8		30
BASIC Compiler 128		42
BASIC Compiler 64		29
Big Blue Reader 64/128		32
Bobsterm Pro 128		42
Bobsterm Pro 64		35
CPM Kit 128		22
COBOL 128 OR COBOL 64	EA	29
Final Cartridge 3		49
Gnome Kit 64/128		29
Mach 128		35
Merlin 128		45
Merlin 64		35
Physical Exam 1541 OR 1571		29
Power Assembler 64/128		30
Power C 64/128		30
Proto Linc BBS 128		45
RAM DOS 128		29
Renegade		29
Super 81 Utilities 128 or 64		29
Super Aide		25
Super C 128 OR 64		45
Super Chips 64		25
Super Chips 128 or 128D		45
Super Disk Utilities		25
Super Librarian 128		19
Super Pascal 128 OR 64	EA	45
Syntech BBS Construction Set		43
Syntech BBS Games Module		18
Sysres Enhanced		30
Warp Speed 128		35
Kracker Jax Volumes 1-4	EA	10
Kracker Jax Volumes 5-7	EA	17
Loaded Gun 2		17
Super Snapshot V3		49
Super Snapshot V3 w/C128 Disk		54

BOOKS

Abacus Books	call
Big Tip Book for Commodore	15
C128 Programmer Ref. Guide	22
C128 Subroutine Library	15
GEOS Prog Ref Guide 2	17
K Jax Revealed Book 1	23
K Jax Revealed Book 2	23
Superbase the Book	15
Troubleshoot & Repair C64	18

MISCELLANEOUS

2-for-1 Serial Box	29
4-for-1 Serial Box	39

MISCELLANEOUS

C64 OR 1541 Cover	EA	7
C128 OR 1571 Cover	EA	9
40/80 Column Switch Cable		18
AB Printer Switch Box		35
Aprospan Cartridge Holder		$27
Drive Box		27
Hotshot Plus Printer Interf.		69
Lightpen 170C		69
Lightpen 184C		49
M3 Proportional Mouse		40
Mousepad		8
Partner 128		39
Partner 64		29
Print & Wear Transfer Paper		17
Quick Brown Box - 32K		79
Quick Brown Box - 64K		99
RGB to TV Cable		9
RS232 Interface Cable		39
Printer Paper		**call
Printer Ribbons		**call
Serial Cable - 6 Foot		9
Super Graphix Gold		89

BRiWALL

Solid Products • Solid Support

P.O. Box 129, 56 Noble St.
Kutztown, PA 19530

TOLL-FREE 24 HOURS
1-800-638-5757

OUR PROMISE

WE GUARANTEE YOUR SATISFACTION

If, for any reason, you are not satisfied with your selection within 15 days of your receipt, simply return the product to us. We will either issue you full credit for exchange on another selection, or refund your purchase price, less $5.00 for restocking and handling. Defective items are replaced free of charge!

Great Products By Free Spirit Software Inc.

1541/1571 Drive Alignment

1541/1571 Drive Alignment reports the alignment condition of the disk drive as you perform adjustments. On screen help is available while the program is running. Includes features for speed adjustment and stop adjustment. Complete instruction manual on aligning both 1541 and 1571 drives. Even includes instructions on how to load alignment program when nothing else will load! Works on the C64, SX64, C128 in either 64 or 128 mode, 1541, 1571 in either 1541 or 1571 mode! Autoboots to all modes. Second drive fully supported. Program disk, calibration disk and instruction manual. only **$25.00**

Super 81 Utilities now available for the C64!

Super 81 Utilities is a complete utilities package for the 1581 disk drive and C128 computer. Among the many Super 81 Utilities features are:

SUPER 81 UTILITIES

- Copy whole disks from 1541 or 1571 format to 1581 partitions
- Copy 1541 or 1571 files to 1581 disks
- Copy 1581 files to 1571 disks
- Backup 1581 disks or files with 1 or 2 1581's
- 1581 Disk Editor, Drive Monitor, RAM Writer
- Supplied on both 3½'' and 5¼'' diskettes so that it will load on either the 1571 or 1581 drive
- Perform many CP/M and MS-DOS utility functions
- perform numerous DOS functions such as rename a disk, rename a file, scratch or unscratch files, lock or unlock files, create auto-boot and much more!

Super 81 Utilities uses an option window to display all choices available at any given time. A full featured disk utilities system for the 1581. only **$29.00**

RAMDOS RAMDOS is a complete RAM based ''Disk'' Operating System for the Commodore 1700 and 1750 RAM expansion modules which turns all or part of the expansion memory into a lighting fast RAM-DISK. RAMDOS behaves similar to a much faster 1541 or 1571 floppy disk except that the data is held in expansion RAM and not on disk. Under RAMDOS, a 50K program can be loaded in ½ second. Programs and files can be transferred to and from disk with a single command. RAMDOS is available for only **$29.00**

PROFESSIONAL CAD FOR YOUR COMMODORE 128!

HOME DESIGNER

This is the most powerful two-dimensional CAD program available for your C128! As an object-based package (this is what the professionals use) your drawings are created and printed with the **greatest accuracy and detail possible.** This object-based design provides extreme flexibility and control over your drawings because each line, circle, text-string, etc. can be manipulated (rotated, enlarged, erased) as a separate entity. **With over 50 powerful commands,** you can translate, rotate and mirror objects. Stretch or shorten lines as needed. Easily create parallel lines. Draw or erase arcs, circles, ellipses and boxes at will. Insert library figures anywhere into drawings at any scale and angle. Scale text to any height and width. Work in either an absolute scale or feet/inches. Your drawing screen (a 16'' by 22'' page) includes **5 drawing layers** that can be selected/included/excluded/erased at will. HOME DESIGNER provides **accurate, lazer-quality output, at ANY scale, on your dot matrix printer or plotter.** Use a joystick or the 1351 mouse as input.

WHEN THE DETAILS ARE IMPORTANT! **Still only $45.00**

THE WRITE STUFF

WRITER & TALKER

This WORDPROCESSOR is by far one of the BEST that we have seen! Let's get right to the specs: 21 function calculator - line up numbers with the decimal tab; 60 customizable help screens - 86K of disk doc's; Double-column printing in one pass; Encyrpt/decrypt text; Sort up to ten columns (great for lists); Merge/Append text files; Link files; Word/paragraph counter; File translator for 15 other W/P's; Dvorak [- -] QWERTY toggle; True 80 column Hi-Res preview; Key-click for typewriter sound; Mail Merge; Automatic Case; On-line clock; 1764 RAM Expander support; MACRO TYPING cuts your typing time by over 25% and more!

The WRITE STUFF even comes in a TALKING version, which includes SAM, a program that produces speech from your computer's sound capabilities. This BB TALKER recites any portion of your text, can say each letter and command as it is typed, and translates to phonetic script for additional editing. **Great for the sight-impaired and the youngsters!!**

C64 version - $19.00 C128 version - $24.00 C64 w/Talker - $24.00

FREE CATALOG

40 pages of detailed descriptions for over 300 fine products for your Commodore computer

CALL OR WRITE FOR YOUR COPY TODAY!

$ $ $ $ $ $ $ $

COLLECT BONUS DOLLARS

One bonus dollar, good towards your next purchase, for every $50.00 ordered!

COLLECT THRU 8/31/88

USE THRU 12/31/88

CALL FOR LATEST PRODUCTS, PRICES AND COMBINATION SPECIALS!

ORDERING INSTRUCTIONS: VISA, MasterCard, Personal Check, Money Order or COD are welcome. Shipping USA: $3.50/ground, $5.50/2nd Day, $14.00/overnight. C.O.D. add $3.00. Canada/Mexico: $6.00 Air Mail. Foreign: $12.00 (for Air Mail use charge & specify maximum). PA residents add 6% sales tax. Include phone number and computer/drive model with order. All items will be shipped immediately, (if we are out-of-stock, we will let you know.) **CHARGE IS PER ORDER.**

For CUSTOMER SERVICE please call us:
Monday thru Friday, 9:30 a.m. - 4 p.m. EST
1 - (215) - 683-5699

VISA MasterCard NO SURCHARGE

```
        TED STRINGS INTO A$ AR
        RAY
SJ 8180 REM FOR I=0 TO NN:A$(I
        )=N$(B(I)):NEXT I
RC 8190 RETURN
KK 8999 REM
CG 9000 REM SAVES SORTED SPEED
        SCRIPT FILE TO DISK
JF 9010 INPUT"ENTER NAME OF OU
        TPUT FILE";F$
HE 9020 OPEN 2,8,4,F$+",P,W":A
        =0
BJ 9030 REM WRITE TWO BYTE HEA
        DER
FQ 9040 PRINT#2,CHR$(0);CHR$(3
        7);
XR 9050 FOR I=0 TO NN
RE 9060 PRINT#2,N$(B(I));
FP 9070 NEXT
HQ 9080 PRINT#2,CHR$(31);:CLOS
        E 2
DK 9090 RETURN
```

To prepare your name list for sorting, place the last name first in each entry, followed by the first name and telephone number. Separate individual entries with a carriage return. Here is an example of what your unsorted file should look like:

Lincoln, Abraham 555-7777
Washington, George 555-8888
Adams, John 555-4444
Roosevelt, Franklin 555-1213

When you run the program, enter the name of the unsorted file at the prompt. The program reads the file from disk, sorts it, and then requests an output filename. Choose a distinct filename. Once the alphabetized file is written, use SpeedScript *to examine or print its contents.*

Currently, the program accepts an unsorted file with as many as 15 entries. If you have more than this, adjust the variable MX in line 20.

Double Trouble

I would like to know how to read the other side of a disk on a 128 with a 1571 disk drive. If I format the disk in 128 mode, is it formatted on both sides or do I have to turn it over? The manual doesn't say anything about that. I have tried using **OPEN 15,8,15,"U0>H1":CLOSE15**, but it doesn't work. Can you help?

Morad Askar
West Germany

Many users are confused by the difference between formatting a double-sided disk and formatting both sides of a single-sided disk. A double-sided disk drive has two read/write heads—one for side 0 and one for side 1. A single-sided disk drive has only one read/write head—the one for side 0. When a disk is formatted double-sided, both sides of the disk are formatted at the same time. When a disk is formatted single-sided, only one side of the disk is formatted. To format the other side, the disk must be flipped over and the format command repeated. Both sides of a double-sided disk may be read without your having to turn the disk over; single-sided disks must be flipped if you want to read the other side.

Disks formatted on the 1571 in its native mode are formatted on both sides. When the 1571 formats a disk, tracks 1–35 are on side 0 and tracks 36–70 are on side 1. To read from side 1, you must request information from one of the tracks on that side (36–70).

The 1571 can be made to format disks on only one side by placing it in 1541 emulation mode. In 1541 mode, the 1571 behaves like a 1541—even using only one side of a disk. The command to place the 1571 into 1541 mode is

OPEN15,8,15,"U0>M0":CLOSE15

To return to 1571 mode, type

OPEN15,8,15,"U0>M1":CLOSE15

Altering Error Messages

Is there any way to intercept an error message, on both the 64 and 128, and go to a subroutine dependent on the error encountered?

Steve Sheldon
Utica, NY

COMPUTE!'s AMIGA Games Disk

A GREAT VALUE!

15 GREAT GAMES FOR ONLY $9.95!

We've collected the best Amiga games from our archives, plus several *super* never-before-published games to put together a great value: 15 entertaining games—from frantic arcade-style to challenging strategy—all on one disk (documentation included) for only $9.95 plus $2 postage and handling. Don't miss out on this deal!

ORDER NOW!

YES! **Send me _____ copies of COMPUTE!'s Amiga Games Disk.**

I've enclosed $11.95 for each copy. _____ **Amount**
_____ **Sales Tax***
_____ **Total**

Name _____

Address _____

City _____ State _____ ZIP _____

COMPUTE!'s Amiga Games Disk
P.O. Box 5188
Greensboro, NC 27403

*New York residents add 8¼ percent sales tax. North Carolina residents add 5 percent sales tax. All orders must be paid in U.S. funds by a check drawn on a U.S. bank. Sorry, no credit card orders accepted.

Disks will be shipped the first week of August. Please allow 4-6 weeks for delivery.

A number of important BASIC routines, including the error handler, vector through a jump table in RAM. Before BASIC prints an error message, it uses location 768 (in both the 64 and the 128) for the address of the error-handler routine. Normally, the two-byte pointer at 768 directs BASIC to the ROM routine that displays the appropriate error message, such as SYNTAX ERROR, ILLEGAL QUANTITY ERROR, and so forth. But since the error vector is in RAM, you can substitute the address of your own error-message routine in place of the standard one.

For example, when you type in BASIC programs having many numeric DATA statements that are POKEd to memory, you'll frequently get an error that's difficult to pin down. If you accidentally include a number higher than 255 and run the program, you'll get the error message ?ILLEGAL QUANTITY IN LINE xx. But the line given as xx is the one containing the READ statement rather than the one with the errant data. The READ works just fine (it's legal to READ numbers greater than 255), but the POKE causes the problem.

The short program below, taken from COMPUTE! Books' Machine Language Routines for the 64 and 128, *solves this problem. Ordinarily, the error vector at 768 points to a routine that prints either a BASIC error message or the READY prompt. Using the .X register, this routine locates the error message in a table within BASIC and then prints it. If you're in program mode, the number of the line that's currently being executed is taken from CURLIN (location 57 on the 64; location 59 on the 128) and is printed as well.*

```
;Custom error handler
;
DATLIN = 63                         ;use DATLIN = 65 on the 128
                                    ;current DATA line
CURLIN = 57                         ;CURLIN = 59 on the 128
                                    ;current BASIC line
ERRNOR = 58251                      ;ERRNOR = 19775 on the 128
                                    ;normal error-service routine
;
;First, redirect 2-byte error vector at 768 to EWEDGE
ERRRDT      LDA   #<EWEDGE  ;low byte first
            STA   768
            LDA   #>EWEDGE  ;then high byte
            STA   769
            RTS             ;and exit the setup routine
;
                            ;Upon entry, .X contains the error
                            ;number. We let the system handle all
                            ;errors except the illegal quantity
                            ;error (error 14).
EWEDGE      CPX   #14       ;Is it an illegal quantity error?
            BNE   EXIT      ;If not, exit through the normal
                            ;error handler. Otherwise, substitute
                            ;the current data line for the
                            ;current BASIC line.
            LDA   DATLIN    ;low byte first
            STA   CURLIN
            LDA   DATLIN+1  ;then high byte
            STA   CURLIN+1
EXIT        JMP   ERRNOR    ;and execute the normal error handler
```

Here, ERRRDT changes the error vector to point to a custom error handler at EWEDGE. If an error other than an illegal quantity error occurs (.X<>14), normal error handling will result. But if .X contains a 14 upon entry into EWEDGE—meaning an illegal quantity has occurred—the current DATA line number (DATLIN) will be stored into the current BASIC line (CURLIN) before the normal error handler executes. And so, in our example above, instead of telling us that the error occurred in the line with the READ statement, with this routine in place, BASIC reports the actual DATA line containing the typo.

Of course, this routine fails to distinguish among the many possible sources of illegal quantity errors. If your program contains a POKE 251,257, for instance, the error message that results will erroneously point you to the last DATA line that was read. Because of this, you should limit the use of this wedge to BASIC programs that contain many numeric DATA statements—primarily BASIC loaders of machine language object code.

The programs below are BASIC loaders—for the 64 and 128, respectively—containing the above machine language routine in DATA statements. To install the custom error handler in your computer, just enter the appropriate version and type RUN. Both programs require only 26 bytes. The 64 version resides at location 49152, and the 128 version, at 4864.

64 Version:

```
FH 10 REM 64 VERSION
BF 20 FORI=49152TO49152+25:READA:POKEI,A:X=X+
      A:NEXT
QJ 30 IFX<>2660THENPRINT"DATA STATEMENT ERROR
      .":STOP
ER 40 SYS49152
DE 50 DATA 169,11,141,0,3,169,192,141,1,3
JF 60 DATA 96,224,14,208,8,165,63,133,57,165
EM 70 DATA 64,133,58,76,139,227
```

128 Version:

```
HA 10 REM 128 VERSION
GE 20 BANK15:FORI=4864TO4864+25:READA:POKEI,A
      :X=X+A:NEXT
SE 30 IFX<>2269THENPRINT"DATA STATEMENT ERROR
      .":STOP
GX 40 SYS4864
EP 50 DATA 169,11,141,0,3,169,19,141,1,3
FM 60 DATA 96,224,14,208,8,165,65,133,59,165
HX 70 DATA 66,133,60,76,63,77
```


COMPUTE!'s GAZETTE
TOLL FREE Subscription Order Line
1-800-727-6937

SOFTWARE CATALOG

√ *40 page software catalog sent to you by first class mail.*

√ *Describes hundreds of computer games in detail.*

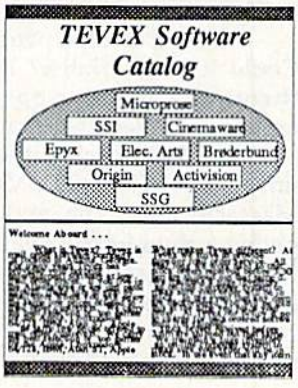
√ *All software at discount prices - 1/3 off retail.*

√ *Tevex offers superior mail order service. Same day shipping on all orders before 3:30.*

√ *Tevex has 5 years of experience in the computer game market.*

√ *Only $1 for our new 40 page catalog.*

√ *Only $3 for a full year's subscription of 2 catalogs and 4 newsletters.*



CALL TOLL-FREE
1-800-456-1162

TEVEX
4205 First Ave #100
Tucker, GA 30084
404-934-5059
1-800-456-1162
We accept Visa or Mastercard

Murder at Palenque

Fred D'Ignazio
Contributing Editor

I was in Palenque, a mysterious Maya ruin hidden deep inside a steaming tropical rain forest on the Yucatán Peninsula in Central America. I climbed the steep, crumbling stone stairs of Palenque's ancient temple. At the top I paused, panting, sweating, my pulse throbbing in my ears. As I looked out across the undulating jungle canopy, I heard the shrieks of howler monkeys. I longed to throw myself into the cool, bubbling waterfall I heard somewhere near the temple.

But I couldn't stop. My best friend had been brutally murdered. And it was up to me to find the killer. My instincts told me that he (or she?) had fled to the tomb of Pacal, Palenque's greatest ruler. But the tomb lay buried in the ruins, protected by winding mazes, steep cliffs, and creepy, crawly things I couldn't see in the murky jungle twilight.

I heard a clapping sound. Could it be the killer? I squeezed through a narrow passageway around a carved stone, and. . . .

And I was back in the auditorium at Lesley College, in Cambridge, Massachusetts. The audience was giving a thunderous ovation to Dr. Kathleen Wilson, who had just finished her Palenque presentation as part of Lesley College's tenth annual Computers in Education conference.

Into the Jungle

Kathy's demonstration was stupendous, the technology unbelievable. As part of the new "Voyage of the Mimi" TV series and multimedia learning package produced by the Bank Street College in New York, Kathy had taken four film crews into the Yucatán jungle, where they shot enough footage to create an interactive videodisc. Now linked with a computer and a joystick, the disc has become a magic carpet. A family can sit in its living room in Midland, Michigan, and instantly be transported thousands of miles to Palenque, one of the most remote and mysterious places in the Western Hemisphere.

You land in Palenque as if you were swooping in on a glider from above the ruins. (They used a glider to capture some breathtaking aerial shots of the site.) You navigate your way through the buildings by moving the joystick. Everything is 3-D. You move the joystick forward, and you move forward; right, and you turn right. At selected points you can look up at the sky and down at your feet. The process of 3-D visuals, jungle sound effects, and self-controlled movement convinces your imagination that you are somehow really there.

But as I watched Kathy demonstrate Palenque, I couldn't help thinking that what she was giving us was not the kind of trip a child would love. Something was missing. Kathy took us through the ruins at a slow, leisurely pace, like a good tour guide, stopping frequently to point out things that adults think are educational and that children find boring. I had the sudden urge to wrestle the joystick from her and jam it forward. Instead of walking, I wanted to *run* about 60 miles per hour through Palenque, hopping over huge stones and leaping across pits.

Then I saw the problem. Kathy was presenting Palenque in "browse" mode. We were browsing through Palenque as if it were a huge museum, and we were careful not to upset any of its ancient dust.

What we needed was a good murder. Some drama, excitement. Something to really capture kids' interest. I told Kathy this after her speech. To my surprise, she smiled and told me to come to her Bank Street office to see what she was currently working on.

Three weeks later I was in New York City at Kathy's office. This time I got a hands-on demonstration. And I was impressed. As part of Kathy's ongoing research using Palenque as a learning tool, she has organized teams of students to do different tasks. All of the teams use the Palenque videodisc as raw material for team productions. A team of Explorers go on expeditions as if they were jungle archaeologists. A team of Treasure Hunters try to find hidden treasure and then write up their experiences as eyewitness reporters would. Members of the third team (my favorite), the Movie Makers, make movies about Palenque using the audio, video, and computer graphics from the videodisc. Their movies, ranging from 2½ to 20 minutes long, are documentaries targeted at other kids their age.

Medium of the Future

After only two hours with Kathy at Bank Street, I came away with more appreciation for the new DVI (Digital Video Interactive) technology invented by GE/RCA's David Sarnoff Research Center. Sarnoff engineers have created a custom (VLSI) chip set that goes into a personal computer. These chips control a CD-ROM player to call up full-motion digitized video, 3-D motion graphics, and hi-fi digitized audio.

I also began to understand the real journey Kathy and her associates are making. It goes far beyond a visit to a Maya ruin. Kathy's work, I now see, is paving the way for us to fully exploit the potential of multimedia computing in the 1990s. At that time, using optical disks, we'll have access to video images, sounds, music, voices, text, animated graphics, and more. Kathy and other multimedia pioneers are showing us how we will someday navigate this medium.

UTILITIES UNLIMITED, Inc.

12305 N.E. 152nd Street
Brush Prairie, Washington 98606

Orders taken 24 hrs. a day; seven days a week.

If you wish to place your order by phone, please call **206-254-6530**. Add $3.00 shipping & handling; $2.00 for COD on all orders. Visa, M/C accepted. Dealer Inquiries Invited.

WORLD'S BIGGEST PROVIDER OF C64/128 UTILITIES

Software Submissions Invited

We are looking for HACKER STUFF: print utilities, parameters, telecommunications, and the unusual.

We now have over 1,000 parameters in stock!

SUPER PARAMETERS 500 PAK

At a time when many programmers are cutting back on writing parameters, we are going full steam! After getting several requests for parameters on many of the "oldies but goodies" **WE DID JUST THAT! ANOTHER 1st: 500 MORE SUPER PARAMETERS** in one pack. This **FANTASTIC 5-DISK SET** is a value of over $100 for less than 1/2.

$39.95

SUPER PARAMETERS 100 PAKS: 1 thru 5

. . . **YOU GET 100 OF THE BEST PARAMETERS, ANYWHERE.** Professionally done, easy to use, reliable, fast and full of performance. This package can remove all protection. Includes titles from all major software publishers for the C64/128.

$14.95@

ALL PARAMETERS ARE TOP QUALITY—NO FILLER OR JUNK

The 'Original' Parameter Cross-Reference

Ever ask, "Is there a parameter for this program? And where do I get it?" **ASK NO MORE!** The answers are all in this book. Over 5,000 listings.

$19.95@

If anything can copy everything, this may be it!

Introducing SUPERCARD

Well folks, here it finally is. THE BEST! There is just not anything better than **Supercard.** Even our competitor has stated that to back up the newest protection schemes, a high powered software/hardware package is needed. **Supercard** is the product of 2 years and $300,000 in total investment. **Supercard** is installed easily into your 1541 or 1541c, in just minutes with no soldering required. This package makes backups of programs that no other utility can touch. With the **Supercard** installed in your 1541 these programs are no threat. This small card (approximately 2" square) plugs in fast and easy with only a screwdriver—and it is software upgradable to cover new schemes. (Call for 1571 version information and price.)

SUPERCARD has done 100% of everything we tested.

$49.95 **C. Games or S. Figher or A. Ranger?** For dual drives add $35.00

Guarantee: If you're not satisfied with **Supercard** for any reason, you may return it in working and saleable condition within 10 days for a full refund, minus shipping and handling charges.

THE FINAL CARTRIDGE III versus super snap shot

The Cartridge war heat up. Well folks, here's the real story!!! In their latest ad, our competition claims they are getting better reviews. Well, that's partly true . . . but mostly false. First of all, they are comparing reviews written about the old Final Cartridge and not the current version III. We at Utilities Unlimited Inc. are so sure that you would choose The Final Cartridge over that other one we make the following offers:

1. 100% no-questions-asked 10-day refund Guarantee.

2. For those of you who bought the super snap shot believing that you were buying the best, then saw the Final Cartridge III, **we offer you $30.00 for your super snap shot, as a trade in for the BEST . . . The Final Cartridge III.**

Every Final Cartridge III now includes many features not found in super snap shot as well as our newest 64/128 nibbler and 100 Super Parameters.

(NOW w/CLOCK) Still only **$54.95**

SIMILAR PRODUCTS MAY APPEAR ELSEWHERE LATER; JUST REMEMBER YOU SAW THEM HERE FIRST!!

PARAMETERS CONSTRUCTION SET

The company that has **THE MOST PARAMETERS** is about to do something **UNBELIEVABLE.** We are giving you more of our secrets. Using this **UNIQUE** program, it will take your data and automatically **WRITE PARAMETERS FOR YOU;** it will also **CUSTOMIZE** the disk with your name. It will impress you as well as your friends. The **"PARAMETER CONSTRUCTION SET"** is like nothing you've ever seen. In fact you can even **READ PARAMETERS** that you may have already written; then by using your construction set rewrite it with your new **CUSTOMIZED MENU.**

$34.95

(Another first!) **THE 128 SUPERCHIP—A, B or C**

A There is an empty socket inside your 128 just waiting for our **SUPER CHIP** to give you 32k worth of great **BUILT-IN UTILITIES**, all at just the **TOUCH OF A FINGER.** You get built-in features: **FILE COPIER, NIBBLER, TRACK & SECTOR EDITOR, SCREEN DUMP**, and even a 300/1200 baud **TERMINAL PROGRAM** that's 1650, 1670 and Hayes compatible. Best of all, it doesn't use up any memory. To use, simply touch a function key, and it responds to your command.

B Has super 81 utilities—a complete utility package for the 1581. Copy whole disks from 1541 or 1571 format to 1581. Many options include 1581 disk editor, drive monitor, Ram writer and will also perform many CP/M & MS-DOS utility functions.

C "C" is for combo and that's what you get. A super combination of both chips A and B in one chip, switchable at a great savings to you. **ALL CHIPS INCLUDE 100 PARAMETERS FREE!**

Chips A or B: **$29.95@** Chip C: **$44.95@**

V-MAX, RAPID LOCK DIGITAL SOLUTIONS™

HES MON cartridges (limited supply)	$ 4.95
1541 Mash (for drive alignment)	$14.95
64 BBS: for 1 or 2 drives	$19.95
64 MODEM prg.: w/wargames auto dialer	$14.95
N-CODER & D-CODER: together for only	$14.95
GRAPHIC LABEL MAKER: the original	$12.95
D-COMPILER: for the famous BLITZ!	$14.95
HEAVY DUTY REPAIRABLE 64 POWER SUPPLIES	$39.95
Too many 64 repairs are due to faulty old supplies—don't wait!	
DISK NOTCHERS: double disk capacity	$ 4.95
SECURITY KEYS: lost your dongle? (Golf & bowling)	$ 3.95
Used super snap shot (limited supply)	$29.95
The Original Geos Standardizer	$ 9.95
SUPER NIBBLER: 64/128	$14.95
SUPER CARTRIDGE	$44.95

LOCK PICK—THE BOOKS—for the C64 and C128

Lock Pik 64/128 was put together by our crack team, as a tool for those who have a desire to see the **INTERNAL WORKINGS** of a parameter. The books give you **STEP-BY-STEP INSTRUCTIONS** on breaking protection for backup of 100 popular program titles. Uses **HESMON** and **SUPEREDIT.** Instructions are so clear and precise that anyone can use it. ★**OUR BOOK TWO IS NOW AVAILABLE**★

BOOK 1: Includes Hesmon and a disk with many utilities such as: **KERNAL SAVE, I/O SAVE, DISK LOG FILE** and lots more, all with instructions on disk. A long-time favorite.

BOOK 2: 100 NEW EXAMPLES, Hesmon on disk and cartridge plus more utilities to include: **A GENERAL OVERVIEW ON HOW TO MAKE PARAMETERS** and a **DISK SCANNER.**

$29.95 each OR BUY BOTH FOR **ONLY $49.95**

Now with FREE Hesmon Cartridge.

For product support, call between 10 a.m. to 4 p.m. Pacific Time.

Deja Vu

The graphics-and-text adventure has been a staple of the computer gaming market practically from the beginning. *Wizardry, Bard's Tale, Amazon, Perry Mason, The Pawn, Faery Tale Adventure, Questron,* and a host of others make up the history, with each game emphasizing something slightly different. Despite this rich history, it is the rare game that merges text and graphics effectively. Most choose to hang a bit of text on a predominantly graphics orientation or to offer pictures that correspond to the situation in the text. Putting the two together has been the hard part.

This is the challenge that ICOM Simulations set for itself in 1985. Its first effort, designed for Apple's then-new Macintosh, was a detective adventure called *Deja Vu*. It was designed to give players a graphics interface to interact with the picture on the screen while a text window explained what was happening and offered descriptions of rooms and items. Partly because good Mac games were rare at the time, and partly because it was simply a very good game, *Deja Vu* became very popular very quickly.

Since then, Mindscape has released two similar products: *The Uninvited* and *Shadowkeep*. Meanwhile, *Deja Vu* has been ported first to the Amiga, then to the Atari ST, and then to the MS-DOS world. The most recent port has been to the Commodore 64.

The challenge in transferring from the 68000 processors of the Mac and Amiga to the eight-bit processor of the 64 was to recreate the smooth interface of the original. The 64 is an excellent machine, but its speed simply isn't up to the standard of the more powerful computers, and it doesn't have a standard mouse interface.

I can report with pleasure that the conversion has been a successful one. A little has been lost in the translation, particularly in the disk speed and the inclusion of a joystick-oriented rather than mouse-based interface, but on the whole *Deja Vu* seems quite at home on the 64. In fact, it's heartily recommended.

A bit of background: As the leading character in *Deja Vu*, you wake up in the toilet stall of a seedy bar. All you have is a trench coat and a failing memory. Inside the trench coat is a gun, a wallet, and a few other items, while all around you are things you can almost, but not quite, remember.

As you leave the washroom and go through the bar, a few things become evident. First, you're not especially popular. The police will happily arrest you and toss you in jail. Second, there seem to be a number of people lying in wait for you, though there is no initial proof of this. There is proof, though, of a body clutching a telephone, a syringe and some strange medicines, and a trail littered with near-memories.

A number of things stand between you and your recovered memory. The first is time. If you take too long to figure out what's going on, your memory will simply lapse into oblivion. Second, if you spend too long in one place, the police will capture you. Third, you can get killed. Down in the sewer lives a man-eating crocodile, and a nearby car has more wrong with it than simply a noisy muffler. More obstacles await, but you'll have to discover these for yourself.

There is real mystery here, and you will quickly find yourself wanting to know just who you are.

What sets *Deja Vu* apart from other graphics-and-text adventures is its user interface. Your joystick maneuvers an arrow around the screen. At the top of the screen, a menu bar contains commands such as Examine, Open, Speak, Operate, and Consume. To examine an object, for example, move the arrow into the Examine box, press the fire button, and then point the arrow at the desired object. Press the fire button again, and the text box will tell you what you've found. More impressive is the Operate command. Click on Operate, then on the object you want to Operate, then on the item you want it to act upon. Firing your gun at the crocodile, for instance, means Operating the Gun on the Crocodile. It all works, and it's all very easy.

A problem with the joystick interface is that the arrow moves much more slowly than it does with a mouse. Knowing this, the programmers eased things somewhat. The number keys on the 64's keyboard operate the menu bar, with 1 activating Examine, 2 activating Open, and so on. This will quickly become your preferred means of issuing commands, since it requires much less joystick maneuvering.

Another option is the default command. If you're facing an unlocked door, for example, you need only double-click the fire button, and the door will open. This replaces the Open command from the menu. Once the door is open, double-clicking again moves you into the next room. A small Location screen on the bottom right makes movement through the bar and around the town easier still.

The 64 version of *Deja Vu* is probably as friendly as it can be, but some things still annoy. Loading the pictures takes, cumulatively at least, a long time. This becomes frustrating after a while. Also, the save-game disk has no menu, so make note of what each save position means. Besides this, the graphics are not as sharp as they are on the Mac or the Amiga (naturally), which makes some of the pictures slightly confusing. Add these up, and you get a game that plays fairly slow.

Deja Vu's strengths, however, outweigh its problems quite easily. The interface is smooth and well-considered, and the whole package is attractively designed. More importantly, it's an interesting situation. There is real mystery here, and you will quickly find yourself wanting to know just who you are. To this extent, *Deja Vu* is quite addictive. Knowing that, it's pleasant to realize that *The Uninvited* and *Shadowgate* are both under development for the 64 environment.

—Neil Randall

Deja Vu
Mindscape
3444 Dundee Rd.
Northbrook, IL 60062
$34.95

Ticket to Washington, D.C.

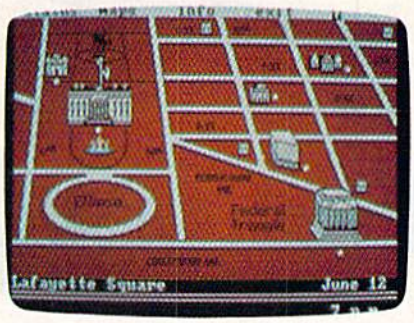
When a program is successful, it's apt to spawn a whole school of similar software. Some of these programs may be virtual clones, some may be mere spinoffs, and still others may be cheap imitations that lack the character of the original. Almost inevitably, the original program sets the standard by which all the others are judged. By combining the elements of travel, graphics adventures, trivia games, mysteries, and arcade animation, *Ticket to Washington, D.C.* is bound to be compared to *Where in the World Is Carmen Sandiego?* (and the other programs in that series). So how does *Ticket to Washington, D.C.* measure up to this paragon of software virtue? Quite well, thank you.

More direct in its attempt to educate you, Blue Lion Software's new program has you seeking the identity of a famous American. You earn leads by answering quizlike questions posed by your Washington guide. (We nicknamed her "Teacher" because of her appearance and because she was always asking questions.)

These leads take you all over Washington via seven detailed maps. Track a lead to the right location, and your contact, a somewhat stiff-faced gentleman, will give you a clue. Compile enough clues, and you can figure out the identity of the famous American. Solve enough of these puzzles, and you'll be admitted to the Hall of Fame of . . . well, that, according to the manual, is a national secret.

The quiz questions in *Ticket to Washington, D.C.* fall into a category most of us would recognize as social studies (history, culture, art, geography, civics, politics), and they're usually related in a general way to the location at which you are quizzed. At the National Air and Space Museum building of the Smithsonian, you may be asked when the first walk on the moon took place.

If you liked the combination of entertainment and education in **Carmen Sandiego,** *you'll like* **Ticket to Washington, D.C.**



When you visit Mt. Vernon, be prepared for questions about Washington's work as an architect.

The leads are more cryptic than the questions, and each is directly related to one of the 45-plus locations in the game. For instance, the lead "Where diplomats dine" would suggest you go to—oops!—can't give that away! Clues provide biographical data on the famous American whose identity you are seeking. One clue reads: "In his diary he referred to himself as cold and austere."

This game is not easy. Our daughter warns you to wear your thinking cap, and she's right. While Blue Lion was thoughtful enough to enclose a note pad for you to use in recording your clues, a reference book of some sort would have proved more helpful. Some of the questions seem obscure,

PART 4
"WESTERN EUROPEAN TOUR"
Scenery Disk is so beautiful to fly, you'll want to make it the centerpiece of your Scenery Disk collection! This is part four of a five-part guided tour from London to Red Square.
This month we continue our tour of Germany. Flying over Frankfurt at night can be a harrowing experience. Here we have a close encounter with a telecommunications tower.
Next stop, Stuttgart! We must approach the city carefully, avoiding the mountain ranges on both sides of our flight path.
Next month - on to Moscow!
"Find Red Square" Contest!
Find Red Square in Moscow and enter to win a real trip for two to Europe, courtesy of SubLOGIC and TWA! See the SubLOGIC Product Chart at your dealer or write SubLOGIC for complete details and contest rules.
TWA
subLOGIC Corporation
501 Kenyon Road
Champaign, IL 61820
(217) 359-8482 Telex: 206995
ORDER LINE: (800) 637-4983

THE DEFINITIVE REFERENCE FOR COMMODORE USERS

GAZETTE™

BACK ISSUES

1983

July (premier issue)—Word Hunt, Enlivening Programs with Sound, Snake Escape, Skydiver
August—Your First Hour with a Computer, The Viper, VIC/64 Mailing List, Wordspell, Hi-Res Graphics Made Simple
September—Telecomputing, Demon Star, Checkbook Reporter, States & Capitals Tutor (V/64)
November—Getting Started with a Disk Drive (Pt. 1), Martian Prisoner, Munchmath, How to Make Custom Characters (V/64)
December—A Survival Guide for Beginners, Getting Started with a Disk Drive (Pt. 2), Space Duel, Bowling Champ, Budget Planner

1984

February—Getting Started with a Disk Drive (Pt. 4), Haunted Mansion, Checkers, Speed Reader, Typing Derby, How to Use Arrays
July—Ultrafont +, Beekeeper, Space Patrol, Robot Math, Downloading, What Is Machine Language?
August—Selecting a Printer Interface, Campaign Manager, Sprite Magic, String Search, Disk Purge
October—The Tomb, Cabby, Quiz Master, Vocab Builder, First Aid, VIC Music Tutor, Turtle Graphics Interpreter
November—Buyer's Guide to Modems, C/G Terminal Program, Bagdad, Supertank, Jump, Budgeteer, Disk Auto Load

1985

August—Mixing Text and Hi-Res Graphics, Disk Backup, Code Cruncher, Hi-Res Toolbox
September—MazeMania, Weather Prophet, Printer Wedge, QuickScan
November—Backgammon, Power Poker, Music Maker, Digi-Clock, Exploring 128 BASIC
December—Whirlybird, Dragon's Den, Graphics Construction Set, SpeedCheck, Disk File Archiver

1986

January—Sprint: A Compiler, BASIC Windows, The Fast Assembler, Disk Disassembler, Off-Screen Trace
February—Lexitron, Snapshot, 128 Memory Map, Disk Editor, Custom Labels
March—Number Construction Set, Cataloger, 128 Auto Boot, ASCII Teleconverter

COMPLETE YOUR COLLECTION!
ANY ISSUE FOR $5

Issues not listed are sold out. Limited quantities available.

Order today!

Note: Only selected titles are listed in contents for each issue

April—Turbo Copy, CP/M on the 128, Directory Filer, 128 Windows, Input Windows
May—Arcade Baseball, Vampyre Hunter, Klondike, Super Synth, Word Counter
June—Solarpix, Quick Key, Fontmaker, Help Screens, 64 AutoBoot Maker
July—Saloon Shootout, Budget Planner, Math Worksheet, Sound Designer 128, CP/M Public Domain Software
August—Address Cataloger, TurboDisk 64, TurboDisk 128, Boldface Print, 128 Sprite Rotator
September—Ultrafont +, Video Jigsaw, Window Wizard, Fast File Copier, 80-Column Character Editor, DOS Window
October—Pig$ for Buck$, Ringside Karate, Menu System, 128 Sound & Music (Pt. 1)
November—Fill-64, 128 Keywords, 1526 Underliner, Turbo Format, 128 Sound & Music (Pt. 2)
December—Q-Bird, Moon Rescue, The Animals' Show (128), Sprite Locater, Bar Charter, 128 Quicksort, 128 Sound & Music (Pt. 3)

1987

January—Keyword Construction Set, One-Touch Function Key, *GEOS* Icon Changer, CP/M: Surviving with 40 Columns
February—Collision Course, Division Worksheet, MetaBASIC 64, MetaBASIC 128, 128 DOS Wedge, 128 Sound & Music (Pt. 4)
March—Ringside Boxing, Color Craft, 128 RAM Expansion, CP/M RAM Expansion, Sprite Manager
April—Omicron, Music Improvisor, *Print Shop* to *GEOS*, TurboSave 128, TurboSave 64, Countdown Timer
May—*SpeedScript 3.0*, Powerball, Cassette Sleeve Maker, No-SYS Loader, Fast Boot, Gameports
June—Bingo, Fraction Practice, Free-Form Filer, Disk Vacuum, Hi-Res Graphics on the 128
July—Basketball Sam & Ed, Calendar Maker, Crash Prevention, 128 Graph Designer, *GEOS* File Storage, Text Framer
August—Bounty Hunter, Sprite Magic, Sprite Stamp, 80-Column Sector Editor (128) Relative Files
September—Sub Attack, Exercise Pacer, Screen Maker, Impossible Scroll, Video Slide Show, 80-Column Magic
October—*SpeedScript 128*, Chopper Pilot, Stars: A Simulation of the Heavens, Directory Magic, Font Printer, Animator 64
November—Litterbug, Sketch Pad, Poster Printer, Renumber 64, Accessing the 128's 80-Column Screen
December—Crossroads, Snake Pit, Word Find, Animal Match, Disk Rapid Transit, PrintScreen, GeoTrash Restorer

1988

January—How to Buy a Modem, Buyer's Guide to Modems, Needlework Graphics Editor, Tile Paint, Sound Manager
February—Buyer's Guide to Graphics Programs, Easy Load, Turbo *SpeedScript*, Fast 64 Mode for the 128
March—CP/M Software for the 128 (Pt. 1), XPressCard 128, ML Cloner, Big Screen, Color Lister
April—CP/M Software for the 128 (Pt. 2), 3-D Speedway, SpeedFile 64, Ramdisk 128, Mirrors
May—Networking the 64, Guide to User Groups (Pt. 1), Treasure Diver, MOBMaker, 128 Math Graphics, 1541 Speed & Alignment Tester
June—Buyer's Guide to Printers, Guide to User Groups (Pt. 2), Arcade Volleyball, Excelfont-80 (128), Graphics Wedge
July—Hard Disk Drives for the 64/128, Civil War on Disk, Quick Save, Error Analyzer, SYS Stamper
August—MIDI Made Simple, Buyer's Guide to Music Software, Cribbage (128), 128 Shell Booter, 3-D Sprites, Zoom

FOR ORDER INFORMATION AND FORM, SEE PAGE 47.

Corresponding monthly disks are available only for issues from January 1986 forward.

Make your best impression!

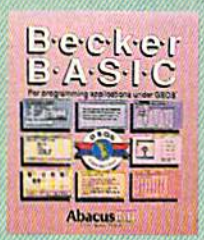
with proven software and books from Abacus.

Super Pascal—Get the fastest and complete Pascal for your computer. Super Pascal is a full implementation of standard Pascal. Extensive editor features search, replace, etc. Even add machine language routines with the built-in assembler. Fast graphics library. C-64 version has high-speed DOS for faster access. More than just a compiler–Super Pascal gives you programming results.
C-64 $59.95 C-128 $59.95

Cadpak—The professional design tool. Enter simple or intricate drawings with the keyboard, lightpen or 1531 mouse. With the flexible object editor you can create libraries of furniture, electronics, etc. as intricate as screen resolution permits. Zoom in to do detailed work. Produce exact scaled output to most printers in inches, feet.
C-64 $39.95 C-128 $59.95

Super C—You can now develop software or just learn C on your computer. Easy-to-use and takes full advantage of this versatile language. Produces 6502 machine code and is many times faster than BASIC. Includes full-screen editor (search, replace and block operations), compiler, linker and handbook. Libraries for graphics and advanced math are included.
C-64 $59.95 C-128 $59.95

BASIC Compiler—Now anyone can make their BASIC programs run faster! Easily converts your programs into fast machine language or speed code.
C-128 $59.95 C-64 $39.95



BeckerBASIC—for writing your own GEOS applications. Adds 270+ commands. Dialog boxes, buttons, pull down menus, hi-res graphics and more.
C-64 $49.95

New!

Amiga®!

BeckerText Amiga is the professional word processor. WYSIWYG formatting. Automatic creation of table of contents and index. Expand-able spelling checker. Merge graphics into text,multiple colums, fill-the-forms generator, much more. $150.00

TextPro Amiga is a full-function word processing package. Easy-to-use, fast and powerful—with a suprising number of extras. $79.95

DataRetrieve Amiga is the powerful, and easy-to-use database. Sets up in minutes. Password security. Large capacity. Performs complex searches. Very flexible. $79.95

AssemPro Amiga unlocks the full power of the Amiga's 68000 processor. Integrated Editor, Debugger, Disassembler and Reassembler. Cross-reference list. Conditional assembly. $99.95

Call (616) 698-0330 or write for your free Amiga software and book catalog. More software and books coming soon!

Commodore is a registered trademark of Commodore Electronics Ltd.
Amiga is a registered trademark of Commodore-Amiga, Inc.
GEOS is a trademark of Berkeley Softworks.

Abacus

Dept. M8 • 5370 52nd Street SE • Grand Rapids, MI 49508

Call 1-800-451-4319 for the name of your nearest dealer or to order direct using your MC, VISA or Amex card. For technical support call 1-616-698-0330 • Telefax 1-616-698-0325 • Telex 709-101
Call or write today for your **free** catalog. Add $4.00 per order for shipping and handling. Foreign orders add $12.00 per item.

particularly if you are unfamiliar with the city of Washington. But therein lies some of *Ticket*'s charm, for there is much to learn from the program. Repeated exposure to the quiz questions and clues will eventually improve your knowledge of social studies. Astute players will even find the answers to the clues among the questions asked. Tracking down leads is somewhat educational, but even more, it shows you what there is to see and do in Washington and how to get around the city.

This is accomplished by the the inclusion of a D.C. Metro System *Pocket Guide* and seven excellent maps. The maps are both artistic and accurate, and transition between them is as smooth as the closing of one window and the opening of another. When you choose to enter a location, the windows close and open again, this time on a graphics representation of the location. These graphics are beautifully done, apparently based on the actual pictures which adorn the manual.

You can, if you wish, open an Information window about a place before you enter it. The window describes the location briefly. This feature comes in handy, as you must solve your case in two weeks, and each stop advances the clock an hour. Information lets you decide whether entering a place will really help. We did run into problems at the Sackler Gallery, however. Instead of getting information, we got a disk error. As far as we could tell, the description for the gallery was accidentally left off the disk.

Ticket to Washington, D.C. does not break new ground. As noted earlier, it is one of those programs belonging to the school instituted by *Carmen Sandiego*. It is solidly executed, and because of that it's a lot of fun to play. We—our daughter included—found ourselves returning to it over and over. In the same way that you buy another mystery novel because you liked the first, those of you who like *Carmen Sandiego* will want to check out *Ticket to Washington, D.C.* Those of you who are unfamiliar with either program but like to combine entertainment with education (or vice versa) should try both. Without competing for the same ground, they will please the same groups of people. And who can't use more of a good thing?

—David and Robin Minnick

Ticket to Washington, D.C.
Blue Lion Software
90 Sherman St.
Cambridge, MA 02140
$34.95

THE GREAT COMMUNICATOR™

The direct-connect Hayes® and Commodore® 1670 compatible 1200 Baud modem for only $74.95!

Everything from Electronic Mail (E-mail) to stock quotes and huge databases of every imaginable type is now on line to the small computer owner. You can even send and receive messages anywhere in the world. All you need is a telephone and a modem which allows your computer to communicate with others.

Almost all modems (and services) are set up to communicate in one or more of three speeds; 300, 1200 and 2400 Baud. Most computer users prefer 1200 Baud. (1200 Baud is about 4 times as fast as 300 which means you spend about ¼ the time and money getting the data you want and more time enjoying it. 2400 Baud is not presently available with all services.)

What is Hayes® compatibility? It's the industry standard and about all modem manufacturers have adopted the "AT" (Hayes) command set. Beware of those who don't. Virtually all software being written now uses Hayes commands. Be sure the modem you buy is truly Hayes® and Commodore 1670® compatible therefore usable in all situations and with all services.
Let's compare Minimodem-C™ with the 1670®, Avatex-e and Volks 6480®.

Comparison of	Minimodem-C™ vs.	1670® vs.	Avatex-e vs.	Volks 6480®
Hayes® Compatibility?	100%	Subset Only	Subset Only	None
Commodore direct Connect?	Yes	Yes	No	Yes
Number of Status Indicators	7	0	8	0
Busy Detect?	Yes	No	No	No
DTR Signal Support?	Yes	No	Yes	No
High Speed Detect Line?	Yes	No	No	No
Number of DIP Switches	8	3	8	0
Number of Status Registers	16	3	16	0
Guarantee	1 yr.	90 days	2 yrs.	5 yrs.

Now you have the FACTS to make an informed decision.

What do you get with Minimodem-C™? Everything! You don't need to worry about cables, compatibility or anything else! The Aprotek Minimodem-C™ plugs directly into your Commodore C-64, C-64C or C-128 USER port. It is unique in that it has two separate (switchable) emulation modes (Hayes and Commodore 1670®) to make it compatible with ALL available software. The Minimodem-C™ is a full feature, 300/1200 Baud modem with Auto Answer, Auto Dial, Touch-Tone or rotary dialing, has status indicators and a built-in speaker. Just plug it into your computer and standard phone jack with the attached cable. Minimodem-C™ is supplied with "Multiterm" 64 and 128, and a free trial subscription to Compuserve.

Built with pride in the USA by APROTEK and fully Guaranteed for 1 year!

Modem shipping—Cont. US $6.00, UPS Blue, CAN, AK, HI, APO $10.00 ORDER #6212. Call for other models.

ORDER INFORMATION California residents add 6% tax. All prices are cash prices—VISA and MC add 3% to total. We ship the next business day on money orders, cashier's check, and charge cards. A 14-day clearing period is required for checks. Prices and availability subject to change—CALL. **Available at Selected Dealers.** Dealers inquiries invited. **2 week satisfaction or your money back trial period on all products.**

For information and in Calif. call 805/987-2454 (8-5 PST)
TO ORDER CALL TOLL FREE—**1 (800) 962-5800 - USA** (7-6 PST)
Or send order to:

APROTEK
Dept. CG
1071-A Avenida Acaso
Camarillo, CA 93010

COLOR RIBBONS & PAPER

COLOR RIBBONS	RED, BROWN,	BLUE, PURPLE,	GREEN, YELLOW,
Ribbons	Price Each	Black	Color	Heat Transfer
Apple Imagewriter I/II	3.75	4.50	6.50
Citizen 120 D	5.00	6.00	7.95
Commodore MPS 801	4.15	4.75	5.75
Commodore MPS 802	6.00	6.75	–
Commodore MPS 803	4.95	5.95	7.00
Commodore MPS 1000	3.95	4.95	6.75
Commodore MPS 1200	5.00	6.00	7.95
Commodore 1525	6.00	–	–
Okidata 82/92/93	1.75	2.25	4.50
Okidata 182/192	6.50	7.50	–
Panasonic KX-P 1090	6.75	7.75	–
Seikosha SP 800/1000	5.25	6.50	7.95
Star SG 10	1.75	2.25	4.50
Star NX10/NL10	5.00	6.00	7.95

COLOR PAPER

BRIGHT PACK—200 Sheets/50 each color: Red, Blue, Green, Yellow. 9 1/2 × 11 – $10.90/pk.

PASTEL PACK—200 Sheets/50 each color: Pink, Yellow, Blue, Ivory. 9 1/2 × 11 – $10.90/pk.

T-SHIRT RIBBONS (Heat Transfer) – Call For Price.

COLOR DISKETTES
5 1/4" DS/DD Rainbow Pack. 10/pack – $12.50

For ribbons & paper not listed above, call for price & avail. Price & spec. subject to change w/o notice. Min. order $25.00. Min. S & H $3.50. Add $2.25 C.O.D. add'l. IL res. add 6.25% tax. MC & Visa accepted.

RENCO COMPUTER PRINTER SUPPLIES
P.O. Box 475, Manteno, IL 60950 U.S.A.
1-800-522-6922 • (IL) 1-800-356-9981
815-468-8081

Now from NRI comes the first course of its kind . . . anywhere!

Learn to use, program, and service today's digital electronic music equipment as you build your own computer-controlled music center

Now NRI puts you at the heart of the most exciting application of digital technology to date! With NRI's new at-home training in Electronic Music Technology, you get hands-on experience with the equipment that's revolutionizing the music industry—Atari ST Series computer with built-in MIDI ports, Casio CZ101 digital synthesizer with advanced MIDI capabilities, and ingenious MIDI software that links computer keyboard to synthesizer keyboard—all yours to train with and keep.

This year, over $1.5 *billion* worth of digital electronic music instruments—keyboards, guitars, drum machines, and related equipment—will be sold in the U.S. alone. Who's buying this new-tech equipment? Not just progressive musicians and professional recording technicians, but also thousands of people who have never touched a musical instrument before. And there's good reason why.

Something called MIDI (Musical Instrument Digital Interface) has suddenly transformed musical instruments into the ultimate computer peripherals . . . and opened up a whole new world of opportunity for the person who knows how to use, program, and service this extraordinary new digital equipment.

Now NRI's breakthrough Electronic Music Technology course puts you at the forefront of this booming new technology with exclusive hands-on training built around a MIDI-equipped computer, MIDI synthesizer, and MIDI software you keep.

Dynamic New Technology Opens Up New Career Opportunities for You

The opportunities are unlimited for the person who's trained to take advantage of today's electronic music phenomenon. Now you can prepare for a high-paying career as a studio technician, sound engineer, recording engineer, or road technician . . . even start your own new-age business providing one-stop sales and service for musicians, technicians, and general consumers alike. Or simply unleash your own musical creativity with the breakthrough training and equipment only NRI gives you.

Only NRI Gives You an Atari ST Computer, Casio Synthesizer, and Innovative MIDI Software You Train With and Keep

The Atari ST Series computer included in your course becomes the heart of your own computer-controlled music center. With its tremendous power, superior graphics capabilities, and built-in MIDI interface, the 16/32-bit Atari ST has almost overnight become the computer of choice for today's most knowledgeable electronic musicians.

The Casio CZ101 digital synthesizer, also included in your training, is the perfect complement to your Atari ST. The polyphonic, multitimbral CZ101—which stores up to 32 voices internally—"communicates" with your ST computer through MIDI, bringing life to virtually any sound you can imagine.

Plus, you get ingeniously designed MIDI software that opens up amazing new creative and technical possibilities . . . you actually build your own 4-input audio mixer/amplifier . . . and you test the electronic circuits at the core of today's new-tech equipment with the hand-held digital multimeter included in your course.

No previous experience necessary—in electronics or music!

No matter what your background, NRI gives you the skills you need to take advantage of today's opportunities in electronic music technology.

With your experienced NRI instructor always available to help, you master the basics of electronic theory step by step, gaining the full understanding of electronics that's now so essential for technicians and musicians alike. You move on to analyze sound generation techniques, digital logic, microprocessor fundamentals, and sampling and recording techniques . . . ultimately getting first-hand experience with today's explosive new technology as you explore MIDI, waveshaping, patching, sequencing, mixing, special effects, and much more.

Plus, even if you've never been involved with music before, NRI gives you enough basic training in music theory and musical notation to appreciate the creative potential and far-reaching applications of today's electronic music equipment.

Send Today for Your FREE Catalog

For all the details about NRI's innovative new training, send the coupon today. You'll receive a complete catalog describing NRI's Electronic Music Technology course plus NRI courses in other high-tech, in-demand electronics fields.

If the coupon is missing, write to NRI School of Electronics, McGraw-Hill Continuing Education Center, 3939 Wisconsin Avenue, Washington, DC 20016.

NRI School of Electronics
McGraw-Hill Continuing Education Center
3939 Wisconsin Avenue
Washington, DC 20016

☑ **CHECK ONE FREE CATALOG ONLY**

☐ Electronic Music Technology ☐ Computers and Microprocessors
☐ TV/Video/Audio Servicing ☐ Basic Electronics

Name _____ *(Please Print)* Age _____

Street _____

City _____ State _____ Zip _____

NRI is accredited by the Accrediting Commission of the National Home Study Council 153-098

X-15 Alpha Mission

Don't pick this one up thinking you are buying a flight simulator. The title is simply an example of using buzzwords to sell a product and has nothing to do with the X-15 research aircraft. However, if you're looking for an arcade target shoot that may be unbeatable, *X-15 Alpha Mission* could be just what you need.

You begin with a scenario, presented in the form of secret orders, stating that a terrorist group has put an armed space station into orbit; the terrorists are threatening to annihilate American cities unless they're paid a ransom. Obviously, this tactic has certain advantages over kidnapping journalists and diplomats, and an organization known as NSA has selected you to fly the X-15 into space and destroy the extortionists.

Something else is going on, however. Whether it is the work of terrorists or simply a bad day, the skies are filled with hostile helicopters, saucer-shaped objects, and some things that look like boomerangs. Before you can even think about flying to the space station, you'll have to fight your way through these airborne objects. There's just one little hitch: They don't fight fair.

After an introductory display of your orders, you find yourself with a cockpit view of an aircraft. The windscreen view occupies the central 40 percent of the screen. Ranged around it are displays for thrust, altitude, radar, compass heading, speed, fuel, damage sustained, and number of hits scored against the enemy. It is a busy screen.

Before you can fly the X-15, you must pass a test in which you match the buildup of thrust. A scale appears in your windscreen, and a clock counts down from ten seconds. A bar moves across the scale, and you press the fire button to match your bar to the one controlled by the computer. On the way back, you match your bar by pulling back on the joystick. Failure to keep a close match resets the game by sending you back for training. While this requires some arcade skills, it is an unnecessary exercise and not one for which anyone would purchase the game.

X-15 Alpha Mission is not a flight simulator—but it is an arcade target shoot that may be unbeatable.

Now you can begin flying, although you never really seem to change altitude. Controls are reversed. A push forward on the joystick sends you up, and a backward pull sends you down—unless you press the SHIFT LOCK key, in which case your joystick acts logically.

At the bottom left of your control panel is a grid showing your position and your destination. During the course of the game, your position will change, but it's dreadfully slow. It may take forever to find the space station.

The enemy aircraft attack almost as soon as you are airborne, and here the sluggish speed of the cursor and the small size of the windscreen are handicaps. A helicopter, nicely done in wireframe graphics, can move across your narrow field of vision so quickly that you may not have time to bring your sights (a set of crosshairs) to bear. Since it will fling a missile at you, your only choice may be to get out of the way.

Helicopters that attack head on are easier to deal with. You see them first as white specks in the distance, and, as they gradually grow in size, you should have plenty of time to lay your sights and fire off a missile. Hits are impressive, with the screen flashing red and shards of the aircraft fanning out around the explosion. You'll be credited for the hit on the gauge at the lower right, while hits on you appear as a percent of damage on a gauge at the lower left.

While helicopters can be destroyed, I did not find this to be the case with the boomerang-shaped objects. Though they appear in the distance and approach head-on, the combination of their erratic movements and your sluggish joystick makes it difficult to align your sights. Even when you do score a hit, it has no effect and the boomerang crashes into you anyway.

This, or a hit by a missile, causes your view screen to fill with static (I suppose it is a TV monitor rather than a windshield), and the game pauses for several seconds as a result.

As for the saucer-shaped objects, they come in so fast I've never been able to shoot one, but the tradeoff is I don't remember their ever having caused me any damage. Perhaps they're only distractions.

I had to do a *lot* of "perhapsing" with *X-15*, for the documentation doesn't reveal a great deal about the game. If a missile hit won't destroy a boomerang, what will? Multiple hits? We aren't told. How do I know when I've completed any of the three levels necessary before going into orbit? If such information appears in the three-page leaflet, I haven't found it.

Once you reach orbit, you have to negotiate your way through an asteroid belt to land on the space station's surface. Pay no attention to the shaky science

COPY II® 64/128

NEW Version 3.3

BACKUP PROTECTED SOFTWARE FAST.

From the team who brought you Copy II for the Apple, the Macintosh and the IBM comes a revolutionary new copy program for the Commodore 64/128 computers.

- Copies many protected programs—automatically. (We update Copy II 64/128 regularly to handle new protections; you as a registered owner may update at any time for $15 plus $3 s/h.)
- Copies even protected disks in under 2 minutes (single drive), 1 minute (dual drive).
- Improved support for ROM updates on 1571 drives.
- Maximum of four disk swaps on a single drive.
- Includes fast loader, 12-second format.

Requires a Commodore 64, 128, or "D" computer with one or two 1541 or 1571 drives.

Sales/Information: call 503/690-8090, 8 - 5 P.S.T., M-F. We accept VISA. Or send a check for $39.95 U.S. plus $3 s/h, $8 overseas.

Technical Support: call 503/690-8080.

$39.95

Central Point Software, Inc.
15220 N.W. Greenbrier Parkway, #200
Beaverton, OR 97006

Central Point Software INCORPORATED

Call for a catalog of our full product line.

This product is provided for the purpose of enabling you to make archival copies only.

that places an asteroid belt in Earth orbit. After all, that same science placed guided missiles on a research craft.

When you attain Earth orbit, your control panel changes completely (or so it says in the documentation). You may deploy a fleet of robots and guide each around the station to connect with a weapons system, whereupon the station will self-destruct. I admit I've never been beyond level 1 of this game (shooting at helicopters and boomerangs), though I consider my joystick talents average. But reading the scenario seems to indicate that destroying the space station will also destroy you, your X-15, and all your robots. It seems a long and involved way to commit suicide.

In spite of good graphics and reasonably good sound, I can't put *X-15 Alpha Mission* very high on my list of good games. Were it not for the sluggish joystick movements and the apparently invulnerable boomerangs, I might have advanced far enough to find more to appreciate. As it is, I left each session feeling that the deck was stacked against me.

On the other hand, if you forget the scenario and the mission—and approach *X-15 Alpha Mission* on an existential level—you might enjoy it as a target-shoot game with no particular beginning or end.

—Ervin Bobo

X-15 Alpha Mission
Absolute Entertainment
P.O. Box 287
Midland Park, NJ 07432
$39.95

COMPUTE!'s Gazette is looking for utilities, games, applications, educational programs, and tutorial articles. If you've created a program that you think other readers might enjoy or find useful, send it, on tape or disk, to: **Submissions Reviewer, COMPUTE! Publications, P.O. Box 5406, Greensboro, NC 27403.** Please enclose an SASE if you wish to have the materials returned. Articles are reviewed within four weeks of submission.

Star Empire

Once upon a time, there was *Elite*, which spawned more than a few children. Those children borrowed from their parent several aspects—a vast galactic milieu, a ship that could be enhanced through trading and purchasing, an economic as well as military playing environment.

Now there is First Row's *Star Empire*, which owes a lot to *Elite*, but which manages to break some (extraterrestrial) ground of its own.

The setting is, again, the universe, with players starting in a small, simple starship. This universe, as is common in this sort of game, is not the most benign of places; there are aliens, natural hazards, and a dire, contagious plague. Finding the cure for the plague is one of your goals.

Commerce plays its part as well, as you endeavor to collect pods containing valuables which can be traded at space stations. It is at the stations that you add equipment to your starship, making it better able to withstand the challenges that you face. While you're at the station, you also receive mission assignments or save your game to disk.

Space, though, is where the action and challenges await. Those challenges come at you furiously via screens that I found gorgeous and almost hypnotic. Your ship holds the center of the screen, which rotates under your control. Ancillary gauges help you set course and direction and keep track of temperature, exposure to radiation, and fuel reserves. As you add gear to your craft, you get other controls and indicators.

Naturally in a game of galactic exploration and exploitation, there are subordinate map screens which can be accessed easily. One screen provides you with detailed views of the solar system in which you are located; another gives you the whole galaxy. In galaxy-map mode, you can scroll a cursor over various star systems, with readouts informing you of their political affiliation, the amount of various minerals ripe for collection, and whether or not the system is infected with the plague.

Excellence...
for the Commodore
The Xetec Product Family
Look for the name that spells *Quality*, *Affordability*, and *Reliability*.

Lt. Kernal - a 20 or 40 Megabyte Hard Drive which supports CP/M.

Super Graphix GOLD - the ultimate printer interface including a 32K buffer, 4 built-in fonts, a utility disk with 27 fonts and more.

Super Graphix - an enhanced printer interface including NLQ, an 8K buffer, reset button, a utility disk with 27 fonts and more.

Super Graphix jr - an economical printer interface with NLQ and graphics.

FontMaster II - a powerful wordprocessor for the C64 with 30 fonts ready to use, 65 commands, font creator and more.

FontMaster 128 - a super wordprocessor for the 128 including 56 fonts ready to use, a 102,000 word spell checker and much more.

All Hardware is FCC Certified All Interfaces include a Lifetime Warranty

C64 and 128 are reg. TM of Commodore Business Machines, Inc.

Xetec 2804 Arnold Rd. Salina, KS. 67401 (913) 827-0685

The main piloting screen contributes a great deal to the feel of the game. Although First Row notes that the ship can be controlled via joystick or keyboard, I found joystick control a little kludgy and quickly shifted to the keyboard, which worked just fine. Unlike *Elite*, which seemed to involve at least half the keys, prompting constant reference to the manual, *Star Empire* places most of its emphasis on a handful of keystrokes, making for an almost effortlessly kinesthetic interface after just a few minutes of play. My fingers quickly learned what to do, leaving my concentration free to focus on the threats I faced.

For a while, though, those threats played second fiddle to the sheer exuberance of flying the starship. The map scrolls and rotates, its starry background contributing to the feel of being in space. Likewise, thrust and attitude respond deftly to keyboard control—not as well to joystick input. Deftness is important: Docking with space stations or maneuvering through a planetary approach requires split-second timing, hair's-breadth positioning.

There are deadlines involved in some of the missions you are assigned, which helps you learn not to waste too much time. As you progress through the game and acquire tools and equipment, you are better able to take advantage of interstellar shortcuts and time-saving routes, enhancing your chances of completing various missions.

The game's ultimate goal is the creation of a shield to protect the entire frontier from alien invasion.

That goal will take a while to attain. In fact, you may find that even intermediate goals are more easily assigned than achieved. *Star Empire* is a lot of fun, but it's not the simplest game in the world to master, even at the lowest levels.

Intergalactic challenges come furiously via gorgeous and hypnotic screens.

In part, the problem stems from the game's documentation, which is enthusiastic in tone but less than successful in execution. First Row has taken a minimalist approach to documenting gameplay: The manual contains a scant 11 pages of instruction, with no illustrations—a serious oversight in a game so dependent upon visual representations of planets, cargo pods, space stations, and so on. Written descriptions, especially those as bare as the ones here, do little to prepare players for encounters with the game's actual graphics.

I feel obliged to note as well that *Star Empire*'s documentation is perhaps as poorly proofread as any I've ever seen. The manual is riddled with typographical errors: *plague* becomes *plauge*, *joystick* becomes *joyrstick*, *which* becomes *whcih*, and so on. The effect, at least for me, was to create some doubt as to the accuracy of the actual instructions.

Which is a shame. *Star Empire* is a rich game, with much to offer in graphics, playability and replayability, challenge, and strategy. That you have to find your way to many of these goals on your own, with little help from the manual, is unfortunate but not, I think, ultimately crippling. I *like* the universe of *Star Empire:* It's a dangerous and entertaining cosmos in which to knock around. In look and feel, *Star Empire* delivers high-quality play. The game is strong enough to overcome its documentation and is well worth a look for fans of *Elite* and *Elite*-type interstellar entertainment.

—Keith Ferrell

Star Empire
First Row Software
900 E. 8th Ave.
Suite 300
King of Prussia, PA 19406
$24.95

THEY TALK THE TALK..

By now you've probably seen all the ads for all the different "Super Cartridges" on the market. And they can talk all day, but let's get real: no cartridge is going to back up 100% of anything, no cartridge is going to turn your C-64 into an Amiga, and no fancy screens or hyperbolic claims are going to give a cartridge any more power than it really has.

That's why SUPER SNAPSHOT is still the best multi-function cartridge on the market. It is a product that is the result of a long process of refinement. Our policy of constant upgrading ensures you that you'll always own a state of the art device. SUPER SNAPSHOT will never be "finalized"—because it's built to evolve.

WE WALK THE WALK

HERE'S WHAT SUPER SNAPSHOT V3 CAN DO FOR YOU!

- Copies 99% of all memory resident software.
- Disable feature for true transparency.
- Extremely compatible Turbo Dos fast loader—1541/71/81.
- Rom based scrolling M/L monitor will NOT corrupt memory.
- Turbo 25—Formats for up to 25 times faster loads.
- Fast data copier, single or dual: 1541/71 and 1581/81.
- Sector editor allows fast examination and modification.
- Free KRACKER JAX parameters for those tough cracks.
- Ten-day money back satisfaction guarantee.
- Files run without the cartridge in place.
- Pre-programmed or user definable function keys.
- Dos wedge supports multiple drives—8, 9, 10, 11.
- High Res and multicolor screen dumps to printer or disk file.
- Fast File copier, single or dual: 1541/71/81.
- Sprite killer and exclusive extended life feature.
- Fast load and save routines are used throughout.
- Super Snapshot V1 and V2 owners may upgrade for $20.00. Call us.
- Our great Slideshow Creator available for only $14.95.
- Attention C-128 owners. An optional switch is available which allows you to disable the C-64 mode without removing the cartridge. Only $5.00 additional.

So while other companies spend their time making their packages better, we'll just keep on making our products better. Because we know the difference between TALKING THE TALK—AND WALKING THE WALK. SUPER SNAPSHOT V3: ONLY $59.95!

SOFTWARE SUPPORT INTERNATIONAL

ORDERING is simple: we accept money orders, certified checks, personal checks on prior approval, VISA, MC, Discover and COD. Please add $3.00 shipping and handling per order. $2.00 additional for COD orders. Orders outside of North America please add $7.50 per cartridge for shipping. Defective items will be replaced at no charge. In-stock orders are processed within 24 hrs. Returns are not accepted without authorization #. Washington Residents please add 7.3% sales tax.

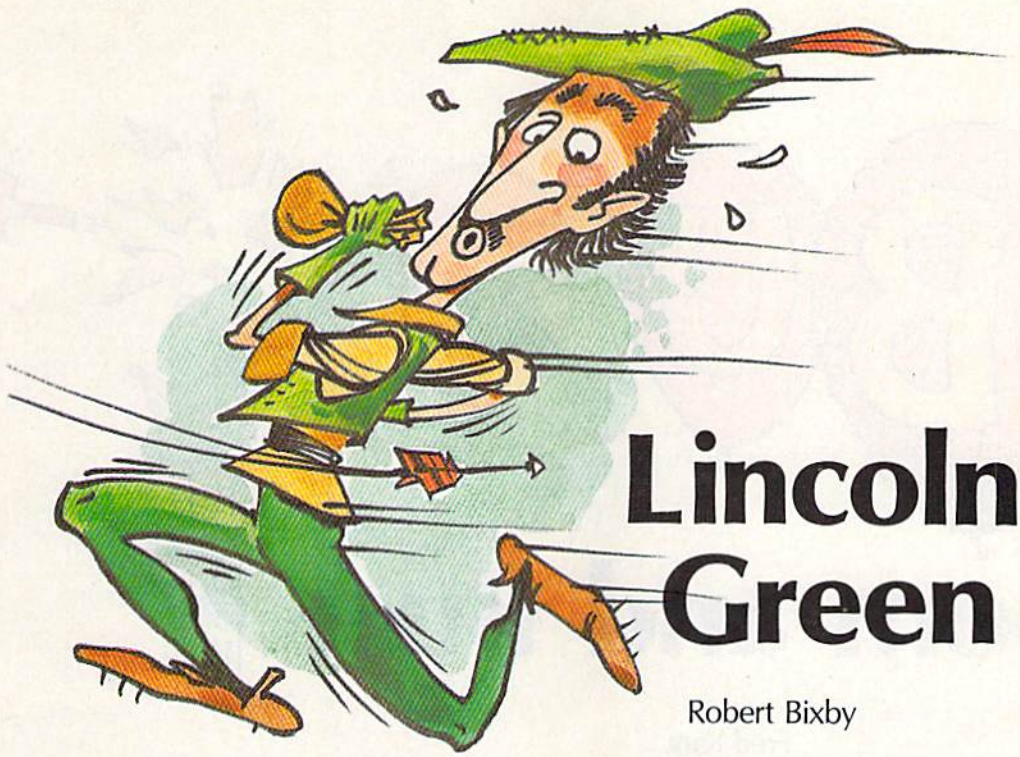
Mail your order to: Software Support Int.-D13
2700 NE Andresen Road / Vancouver, WA 98661

Or call our toll-free order line at 1-800-356-1179, 9am-5pm Pacific time, Monday-Friday. After hours orders accepted at (206) 695-9648 7 days a week. Technical support available. Call (206) 695-9648, 9am-5pm Pacific time, Monday-Friday.

VISA MasterCard DISCOVER

In Canada order from: Marshview Software, PO Box 1212, Sackville NB E0A-3C0 only $69.95 CDN.

DEALERS — WE HAVE THE SUPPORT YOU'RE LOOKING FOR!



Lincoln Green

Robert Bixby

Dodge the arrows, but keep a close hold on the loot in a mad rush to safety through an enchanted forest. For the 64. Joystick required.

There's nothing more beautiful than an enchanted forest. Unfortunately, there's also nothing more dangerous.

You, Lincoln Green, defender of the poor, are on the run from the sheriff of Nottingham after having stolen £600 of gold dust from a nobleman. In your haste, you have accidently slipped into Enchanted Forest instead of the nearby Sherwood Forest.

Now that you're in the thick of the woods, you realize that something is dreadfully wrong. Magical trees are blocking your path. The path changes every time you turn around. Worse, every time you bump into a tree, you spill some of the gold dust. You must keep your cool—the sheriff's best archers are all around you. You had better find your way to safety.

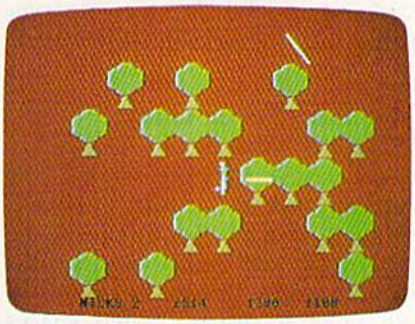
Typing It In

Since "Lincoln Green" is written in machine language, you must type it in with "MLX," the machine language entry program located elsewhere in this issue. Type in, load, and run MLX. When you are prompted for the starting and ending addresses of the program, respond with these values:

Starting address: 0801
Ending address: 15F0

Type in the data and save the program to tape or disk.

Before loading Lincoln Green, plug a joystick into port 2. Lincoln Green can be loaded and run just like a BASIC program.



Arrows fly in "Lincoln Green," an arcade-style game that takes you back to a not-so-merry England.

When you run the program, you'll see your alter ego, Lincoln Green, standing in the forest. Push the joystick in the direction you wish to follow. Make haste (but carefully) through the forest paths. Dodge the arrows that are shot by the sheriff's archers.

At the bottom left corner of the screen is a number that shows how many times you have been nicked by arrows. If you are hit by ten arrows, you'll lose the game. To the right is the monetary value of the gold dust you are carrying. If this drops to 0, you lose.

At the bottom right corner of the screen, you'll see counters that show how far away you are from safe haven. Sanctuary is located at longitude 0, latitude 0. Begin your journey by finding the correct direction in which to run (this direction is different each time you play). When you get close to Sanctuary, the archers pull out their crossbows and fire bolts that are faster and heavier than the arrows.

It's going to be a long day.

See program listing on page 76.

Boom and Bust

Fred Karg

An arcade-style word game? That's "Boom and Bust," a clever challenge for one or two players. For the Commodore 64 with a disk drive. Joystick(s) required.

"Boom and Bust" is a word game like Hangman, but with a new twist—instead of typing in the letter you wish to guess, you must launch a clown out of a cannon to pop a balloon that holds the letter you desire. For one or two players, it's fun to play, and it also has some educational value.

Getting Started

Boom and Bust consists of two programs. Program 1 is written in BASIC. Type it in and save it to disk. Program 2 is written in machine language, so it must be entered with "MLX," the machine language entry program found elsewhere in this issue. Run MLX. When it prompts you for a starting and an ending address, respond with the values indicated below.

Starting address: 3EC0
Ending address: 4487

Be sure to save a copy of the data from Program 2 before you exit MLX. Save the data with the name "B&B.ML".

Load and run Program 1. You'll be asked to choose the number of players. Press 1 or 2. If you choose the one-player game, plug a joystick into port 2. For a two-player game, plug joysticks into both ports.

The Two-Player Game

When the game begins, a category name is given on the screen. The category will be *occupation*, *phrase*, or *thing*. Below the category, the pattern for the puzzle appears. As in Hangman, the pattern shows where letters are and where spaces are. For example, CHAIRMAN OF THE BOARD would be represented by _.

A flurry of balloons, each with a letter printed on it, floats across the screen. To choose a letter, move underneath the balloon by moving the joystick left or right. Then press the trigger to launch the clown. If the clown hits a balloon, that balloon's letter is your guess. Ten points are awarded for each letter that appears in the puzzle.

Suppose you hit the R balloon. In the example above, you'd see _ _ _ _ R _ _ _ _ _ _ _ _ _ _ _ _ _ _ R _. In the two-player game, a missed balloon or a wrong letter causes you to lose your turn. When you lose your turn, your opponent takes control of the cannon.

If you believe you can guess the puzzle, press f1 during your turn. Type in your guess. If you're right, you'll gain 500 points, plus 10 points for each balloon you've popped. If you're wrong, it's your opponent's turn.

The game ends when all the phrases have been exhausted.

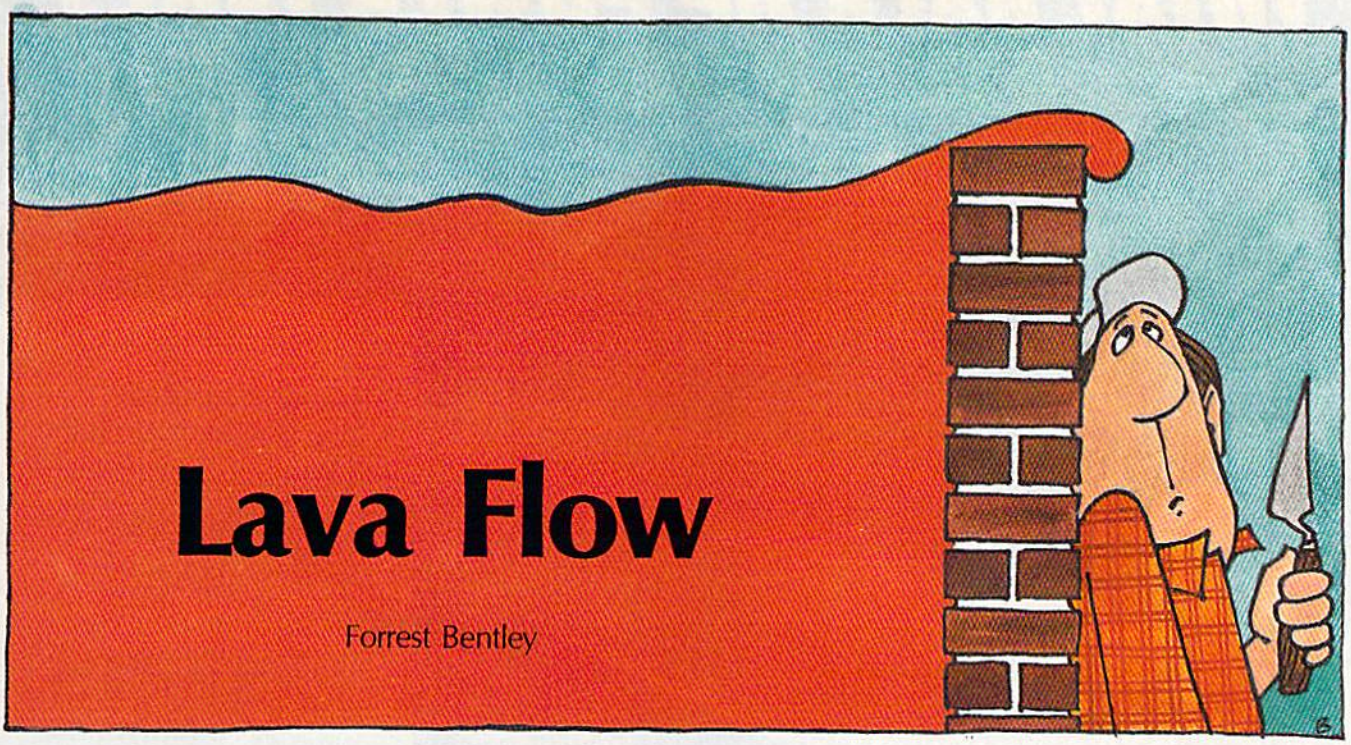
The One-Player Game

The one-player game is similar to the two-player game. The difference is that you play for a maximum number of points.

A bonus timer is located on the right side of the screen. The bonus starts at 100 points and counts down by decrements of 10 points. The bonus decreases whenever you miss all the balloons or hit a balloon that has a letter not found in the puzzle.

If you guess the word correctly, you get 500 points for guessing the puzzle, plus 10 points for each correct letter, plus any bonus left on the bonus timer.

See program listings on page 86.



Lava Flow

Forrest Bentley

It's a bricklayer's nightmare. Build walls to protect yourself from the fast-moving and relentless molten rock in "Lava Flow," a two-player arcade-style game for the Commodore 64. Joystick(s) required.

There's no doubt about it—things will get hot tonight. You and a competitor are trapped in a room. There's nothing especially interesting about this room—except the hole in its center, that is. Through this hole, lava flows into the room. Your only defense against the lava is the rudimentary bricklaying equipment you possess. But while the bricks you lay will protect you for a while, the lava is relentless, so your goal is to last longer than your opponent.

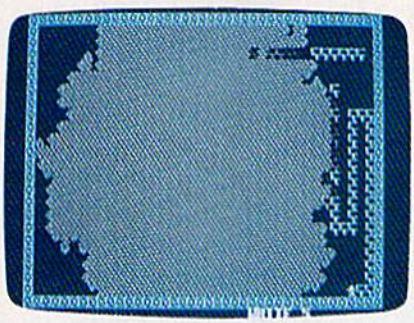
"Lava Flow" is a two-player game that demands savvy and quick reflexes. Hesitate even one moment and your opponent could push the advantage.

Typing It In

Lava Flow is written entirely in machine language, so you must type it in using "MLX," the machine language entry program found elsewhere in this issue. When MLX prompts you for starting and ending addresses, respond with the following values.

Starting address: C000
Ending address: C83F

Before exiting MLX, be sure to save a copy of the program to tape or disk.



The lava has nearly made history out of this brickwork.

Survival of the Fittest

To play Lava Flow, plug two joysticks into the computer. Now, load the program with a statement of the form LOAD"LAVA",8,1 for disk or LOAD"LAVA",1,1 for tape. To start the program, type SYS 49152.

Move your player with your joystick. The white player uses joystick 1; the black player uses joystick 2. Move your joystick in the direction you want your onscreen alter ego to follow.

Although the lava spreads quickly, you aren't totally defenseless—you can build walls. Press and release the joystick's fire button to leave a trail of bricks behind you. Press and release the button again to stop laying bricks. Notice that you move much faster when you're not laying bricks. And you can't move through bricks. The lava can, but it slows in the process.

Sooner or later, the lava will touch you or your opponent. When this happens, that player gets a "hot foot" in the truest sense of the phrase, and the other player gains one point. Lava Flow ends when one player has accumulated five points.

After the game, you're asked if you'd like to play again. Answer Y if you would, N if you'd rather not.

Strategy

It's been said for some games that the best offense is a good defense. A good defense certainly helps in Lava Flow. The more bricks you lay, the more slowly the lava will invade your territory. You and your opponent may want to spend a few games building walls in different patterns. That way, you'll see what makes a good wall and what makes a poor one.

Once you've mastered defense, you'll want to work on offense. One solid (and nasty) Lava Flow tactic is to rush to the other side of the room to build a one-layer wall around your opponent. After you've done the dirty deed, build a more secure wall around yourself and wait for the inevitable.

See program listing on page 78.

TOTAL BACK UP POWER TAKES A QUANTUM LEAP!

ACTION REPLAY IV THE ULTIMATE UTILITIES/BACK-UP CARTRIDGE FOR THE 64/128

• Action Replay allows you to Freeze the action of any memory Resident Program and make a complete back-up to disk or tape – but thats not all . . . . Just compare these features

- Simple Operation: Just press the button at any point and make a complete back-up of any* memory resident program to tape or disk.
- Turbo Reload: All back-ups reload completely independantly of the cartridge at Turbo speed.
- Sprite Monitor: View the Sprite set from the frozen program – save the Sprite – transfer Sprites from one game to another. Wipe out Sprites, view the animation on screen. Create custom programs.
- Sprite Killer: Effective on most programs – make yourself invincible. Disable Sprite/Sprite/Backround collisions.
- Unique Picture Save: Freeze and save any Hires Screen to tape or disk. Saved in Koala, Blazing Paddles Format.

ONLY $59.99

POWERFUL DESIGN WITH ON BOARD LSI LOGIC PROCESSOR CHIP PLUS 40K OF ON BOARD ROM/RAM!

- Compactor: Efficient compacting techniques – 3 programs per disk side – 6 programs if you use both sides.
- Single File: All programs saved as a single file for maximum compatibility.
- Utility Commands: A host of additional commands: – Autonum, Append, Old, Delete, Linesave, Printer lister
- Screen Dump: Print out any Screen to Host or Printers. 16 Gray Scales, Double size print options.
- Unstoppable Reset: Reset button to Rectrieve System and Reset even so called Unstoppable Programs
- Fully Compatible: Works with 1541/C, 1581, 1571 and Datacassette with C64,128, 128D (in 64 Mode)
- Compatible: With Fast DOS and Turbo Rom Systems
- Disk Utilities: Fast Format, Directory, List, Run and many other key commands are operated by Function Keys

- Unique Restart: Remember all of these utilities are available at one time from an integrated operating system. A running program can be Frozen to enter any Utility and the program is restarted at the touch of a key – with out corruption

LSI Logic Processor: This is where Action Replay IV gets it's power. A special custom LSI chip designed to process the logic necessary for this unmatched Freeze/Restart power. No other cartridge has this power!

UNIQUE FEATURES:

WARP 25

Loads 50K in under 5 seconds!!

The it true action replay features 'Warp 25' the world's fastest disk serial Turbo. A typical backup will reload in under 5 seconds.

● No additional hardware required ● No special formats ● Super reliable ● Remember this is not a system where files have to be converted – with action replay you simply save directly into Warp 25 status – reload in seconds. ● Backup all your existing programs to load at unbelievable speed!! ● Because AR4 has on board ram it can also load commercial disks directly at 25 times speed.

This is unique to Action Replay!!

● Warp Save/Load Available straight from Basic.

Plus unique Code Cracker Monitor

● Freeze any program and enter a full machine code monitor ● Full Monitor Features – Disassemble, Hex, Find, Jump, Compare, Replace, Two Way Scroll, Full Disk Load/Save, Printer Support etc. In fact all usual monitor commands plus a few others. ● Because of Action Replay's on Board Ram the Frozen program can be looked at in it's ENTIRETY – In it's Frozen state That means Video Ram, Zero Page etc. and remember you see the code in it's Frozen state not in a Reset state as with competitors products. ● Restart the program at any point. ● No corruption ● An absolute must for the program Hacker – make changes and see your result's instantly!

PLUS SUPPORT UTILITIES

Action Replay Graphics Support Disk

To help take advantage of action replay's unique power to freeze any screen and save it into your fewourite graphics package we have prepared a suite of graphic support facilities.

● **Screen Viewer** View screens in a "slide show" sequence – Joystick control simple to use. ● **Message Maker** Add scrolling messages to your saved screens with music, very easy to use. ● **Prosprite** A full sprite editor, modify/save/load feature, full edit facilities. ● **Zoon Lens** Explode sections of any saved screen to full size including Border – Superb fun and very useful.

ONLY $14.99

Action Replay Parameter Support Disk

Action Replay can backup any memory resident program plus the majority of multiloading disks. To further enhance your ability to backup the small number of tricky programs we have a number of useful utilities and tips to help, these include a disk nibbler, track sector editor, special file copier, plus a number of others. A must for the dedicated cracker

ONLY $14.99

* In our most recent test we were unable to find any program that AR4 could not cope with.

ORDERS ONLY

1-800-782-9110

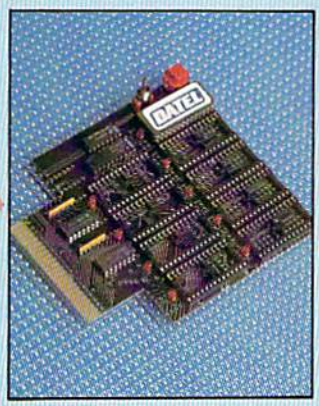
NOTE: – Technical or any other type of Enquiry cannot be answered by the staff on this number.

FAX: (702) 454 7700 (After 7.30 pm)
TELEX: 6503441417 MCIVW
TECHNICAL/OTHER ENQUIRIES
(702) 454 7700
5.30pm to 7.30pm (Pacific Time) and Sat - Sun

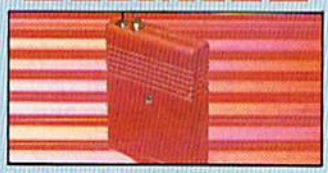
DATEL COMPUTERS

256K SUPEROM EXPANDER

- Now you can select from any of 8 32K EPROMs instantly.
- 8 sockets to accept upto a 32K EPROM in each.
- On board operating system – no programs to load.
- Program your own EPROMs using our EPROM programmer.
- No need to have loads of cartridges – just make a selection from the Superom menu.
- Directory of utilities on power up.
- Fully menu driven on power up.
- Select any slot under software controls.
- Unique EPROM generator feature will take your own programs – basic or m/c and turn them into autostart EPROMs. (EPROM burner required).
- Accepts 2764/27128/27256 EPROMs.
- On board unstoppable reset.



ONLY $49.99



ULTRA CRUNCHER

• The ultimate cartridge based program compactor.

- Compact by upto 30%!
- More programs per disk.
- 3 compacting programs on one cartridge
- Fast loading/saving routines – works with Disk Demon
- Can even further compact AR III files!
- 250 block file copy function
- Full DOS support including fast format

ONLY $24.99 COMPLETE

OR $14.99 ROM ONLY

DUPLIKATOR™

- Copies whole disk in one pass – only one drive required!
- Makes back-up copies in eight seconds!!
- Duplikator is the fastest, most efficient and easiest to use disk copying system ever conceived.
- Comes complete with 256K on-board ram and it's own operating system – no software to load.
- Makes multiple copies from one original.
- Full disk verification during back-up process.
- Copies standard software as well as errors 21-29 and upto 40 tracks.
- Full disk error check in eight seconds.
- Full disk verify against ram in fifteen seconds.
- A must for clubs, user groups etc. How else can you copy over 250 disks an hour for less than $200.
- Comes complete with on/off switch and reset button.
- Fitted in minutes – no soldering usually required.

ONLY $159.99

TURBO ROM II

Turbo Rom II is a replacement for the actual kernal inside your 64. It provides superfast load/save routines.

- Loads/Saves most programs at 5-6 times normal speed.
- Improved DOS support including 10 sec format.
- Programmed function keys:- load, directory, old, etc.
- Return to normal kernal at flick of a switch.
- FCOPY – 250 block file copier.
- FLOAD – special I/O loader.
- Plus lots more.
- Fitted in minutes – no soldering usually required. (On some 64's the old ROM may have be desoldered).

ONLY $24.99

EPROMMER 64™

- A top quality, easy to use EPROM programmer for the 64/128.
- Fully menu driven software/hardware package makes programming/reading/ verifying/ copying EPROM's simplicity itself.
- Will program 2716, 2732 2764, 27128 and 27256 chips. 12.5, 21 or 25 volts.
- Fits into user port for maximum compatibility with cartridges/Superom Board etc.
- Full feature system – all functions covered including device check/verify.
- We believe Eprommer 64 is the most comprehensive, most friendly and best value for money programmer available for the 64/128.
- Ideal companion for Superom Board. Cartridge development System, our kernal expanders or indeed any EPROM base project.
- Comes complete with instructions – plus the cartridge handbook.

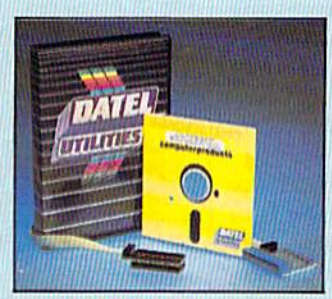
ONLY $69.99 COMPLETE

TOOLKIT IV

The ultimate disk toolkit for the 1540/1541

- A disk toolkit is an absolute must for the serious disk hacker. Toolkit IV has more features than most for less.
- DISK DOCTOR V2 – Read and write any track and sector including extra and renumbered tracks. Repair damaged sectors. Look underneath read errors.
- HEADER/GAP EDITOR – Decodes and displays ALL header information including off bytes and header gap. Rewrite the entire header and header gap. Renumber sectors. Also edit any sector tail gap.
- DISK LOOK – Sort directory. Recover lost files. Display file start/end addresses. Disassemble any file program directly from the disk to SCREEN or PRINTER including undocumented opcodes. Edit Bam. Much, much more.
- FILE COMPACTOR – Can compact machine programs by up to 50%. Saves disk space. Compacted programs run as normal.
- FAST DISK COPY – Copy an entire disk in 2 minutes or less using single 1541.
- FAST FILE COPY – Selective file copy. Works at up to 6 times normal speed.
- FORMATTER – 10 second format an entire disk or format any individual track or half track 0 to 41. Redefine any of 30 parameters to create or recreate unique disk formats.
- ERROR EDIT – Quickly find and recreate all read errors including extra and renumbered tracks or sectors and half tracks from 0 to 41. Even recreates data under errors and allows you to redefine any necessary parameters.

ONLY $14.99



DEEP SCAN BURST NIBBLER™

- The most powerful disk nibbler available anywhere, at any price!
- Burst Nibbler is actually a two part system – a software package **and** a parallel cable to connect the 1541/1570/1571 to 64/128 (state type).
- What gives Burst Nibbler its power? Conventional nibblers have to decode the data from the disk before it can transfer it using the serial bus – when non standard data is encountered they are beat. Burst Nibbler transfers data as raw GCR code via the parallel cable without the need to decode it so you get a perfect copy to the original.
- Will nibble upto 41 tracks.
- Copy a whole disk in under 2 minutes.
- Full Instructions.
- Regular updates – we always ship the latest.
- Fitted in minutes – no soldering usually required.
- Full or ½ tracks.
- No need to buy parallel cable if you have Professional DOS etc.
- Cable has throughbus extension for other add ons.

ONLY $39.99 COMPLETE

SOFTWARE ONLY $19.99

CABLE ONLY $19.99

BURST NIBBLER PARAMETER DISK

Burst Nibbler is the most powerful Nibbler around – but even the best can be better. This disk contains dozens of parameters specially written for the protection schemes impossible to Nibble. These are mainly 'Vmax' and 'Rapidlock' and include titles such as 'Defender of the Crown,' Gauntlet etc. Regularly updated to include any new titles. This disk is by no means a necessity – the standard Burst Nibbler will copy 98% of software as is – if you want to go to the limits, this is the product for you!

ONLY $14.99

EXTERNAL 3.5" DISK DRIVE

- Slimline extra low profile unit – only 6" long!
- Top quality NEC drive mechanism.
- Throughport allows daisychaining other drives.
- A superbly styled case finished in amiga colours.
- Fully compatible.
- 1 meg unformatted capacity.
- Good length cable for positioning on your desk etc.
- Complete – no more to buy.

ONLY $169.99

512K RAM EXTENSION ● A500

- Available with/without calendar clock option.
- Simply plugs internally into a A500 slot.
- Switch in/out with switch supplied.
- Fitted in minutes – no soldering etc.
- With calendar/clock onboard time/date automatically booted.
- Battery backed to retain time/date.

ONLY $119.99 for standard 512K card or

ONLY $139.99 for version with clock/cal.

MIDIMASTER

- Full Midi Interface for A500/2000/1000 (Please state model).
- Compatible with most leading Midi packages (inc. D/Music).
- Midi In – Midi Out x 3 – Midi Thru.
- Fully Opto Isolated
- No need to p / more – Full Midi standard.

ONLY $49.99

VISA®

MasterCard

Add $4.00 Shipping/ Handling

CHECKS/ MONEY ORDER/ CODS ACCEPTED.

DATEL COMPUTERS
3430 E. TROPICANA AVE., UNIT #67
LAS VEGAS
NV 89121

The Pigeonhole Analogy

Larry Cotton

The most misunderstood concept in BASIC is the array. It may also be BASIC's most useful abstraction. An array is a flexible way of expressing and manipulating variables.

In the course of this column, we've studied two types of variables—numeric and string. Let's review them briefly.

Numeric variables, such as X or LO, stand for numbers such as 34 or 5.678 and can be mathematically manipulated—added, subtracted, multiplied, and so forth.

String variables, such as N$ or AD$, usually represent words such as *SYLVIA* or *CLEVER*. They can also represent symbols and numbers such as $1,728.00; however, numbers represented as strings cannot be mathematically manipulated.

Both numeric and string variables can be expressed in array format. Arrays are recognized by the parentheses that are an integral part of their syntax. The number between the parentheses is called the *subscript* (hence the other name for arrays—*subscripted variables*).

Three Ways to Skin a Cat

Enter this short program. It does not use arrays. Enter RED, GREEN, and BLUE as responses when you see the prompt.

```
10 INPUT "FIRST COLOR";C1$
20 INPUT "SECOND COLOR";C2$
30 INPUT "THIRD COLOR";C3$
40 PRINT: PRINT "PRESS ANY KEY TO
   SEE COLORS.": PRINT
50 GET A$:IF A$="" THEN 50
60 PRINT C1$
70 PRINT C2$
80 PRINT C3$
```

Run the program and observe the results. Now try the following program.

```
10 INPUT "FIRST COLOR";C$(1)
20 INPUT "SECOND COLOR";C$(2)
30 INPUT "THIRD COLOR";C$(3)
40 PRINT: PRINT "PRESS ANY KEY TO
   SEE COLORS.": PRINT
50 GET A$:IF A$="" THEN 50
60 PRINT C$(1)
70 PRINT C$(2)
80 PRINT C$(3)
```

What advantage was gained by using an array? None here. But in the following program, we use the array to shorten the program dramatically.

```
10 FOR CO=1 TO 3: PRINT "COLOR
   NO."CO: INPUT C$(CO): NEXT
20 PRINT: PRINT "PRESS ANY KEY TO
   SEE COLORS.": PRINT
30 GET A$: IF A$="" THEN 30
40 FOR CO=1 TO 3: PRINT C$(CO):
   NEXT
```

Run this one. The results are the same, but the program is much more efficient.

Variables as Birdhouses

Think of the C$( ) array as a row of three little boxes, like pigeonholes. Into these pigeonholes, which have the names C$(1), C$(2), and C$(3), we're going to stick three color names.

In line 10, we use a FOR-NEXT loop to load the little boxes. As CO increments from 1 to 3, the boxes are filled with the color names: C$(1) becomes "RED", C$(2) becomes "GREEN", and C$(3) becomes "BLUE". The numeric variable CO is the index to the array.

In line 40, we increment the FOR-NEXT loop again from 1 to 3, and the contents of the little boxes are printed on the screen.

These same principles can be applied to numeric variables.

```
10 FOR T = 1 TO 5: PRINT
   "NUMBER"T;
20 INPUT N(T)
30 J = J + N(T): NEXT
40 PRINT: PRINT "TOTAL IS"J
```

Lines 10–30 contain a FOR-NEXT loop which asks the user to type in numbers and adds them up as they are entered. J begins as 0 when the program is first run, and increments by the amount N(T) five times. Line 40 prints out the total.

Note that in both of our array examples, the contents of the pigeonholes are not emptied when printed. They still contain the names or numbers as originally entered. Thus, further manipulation is easily accomplished.

Let's draw an analogy between types of variables and geometric figures. Think of a single variable, such as X, as a dot. Now think of our pigeonholes as a row of very closely spaced dots that form a line. Lines are one-dimensional; the type of array we've dealt with so far is one-dimensional.

As you might expect, there are also multidimensional arrays. If you extend our geometric analogy further, an array that correlates to a plane surface (such as a sheet of paper) is two-dimensional.

These are examples of two-dimensional arrays:

```
A$(4,5)
CD(13,52)
TABLE$(30,40)
```

One way to fill a two-dimensional array is with a nested FOR-NEXT loop:

```
10 J=1
20 FOR T=1 TO 10
30 FOR U=1 TO 6
40 X(T,U)=J: J=J+1
50 NEXT U: NEXT T
```

In this very simple example, we have loaded a two-dimensional array with the numbers 1–60. The first pigeonhole is labeled X(1,1) and contains 1; the last is X(10,6), which contains 60. If you type PRINT X(4,6) and press RETURN, you should get 24. What do you think the result of typing PRINT X(6,4) would be?

A Dozen or More

The methods we've seen so far work for arrays which do not exceed 11 elements in any one dimension. But often we need more. Larger arrays must be dimensioned before use. This is done with the DIM statement, which reserves

space in the computer's memory for the array and sets all array values to 0. A typical DIM statement looks like this:

```
10 DIM A$(50)
```

In this case, the computer sets aside space for 51 variables. (Arrays are numbered from 0 to the number in the parentheses.) Once an array is dimensioned, it cannot be redimensioned. If you try that, you'll get a REDIM'D ARRAY error when the program is run. And if you try to use a variable subscript greater than the subscript in the DIM statement, you'll get a BAD SUBSCRIPT error.

Multidimensional arrays are dimensioned in a similar manner:

```
DIM A$(45,34)
```

More than one variable can be dimensioned in the same DIM statement, but note that the following statement does not create a multidimensional array:

```
DIM A$(15),B$(25)
```

Here's an example that uses READ and DATA in association with a two-dimensional array. The DATA lines contain speed information for a four-car, five-lap race:

```
10 DIM S(4,5):REM 4 X 5 ARRAY
20 FOR C=1TO4:REM C=CAR NO.
30 FOR L=1TO5:REM L=LAP NO.
40 READ S(C,L):REM READ SPEED
50 NEXTL:NEXTC
100 DATA 108,110,122,120,117
110 DATA 118,114,116,114,110
120 DATA 120,123,119,124,125
130 DATA 100,112,115,117,119
140 INPUT "WHICH CAR NO.";C
150 IF C<1 THEN 140
160 IF C>4 THEN 140
170 INPUT "WHICH LAP NO.";L
180 IF L<1 THEN 170
190 IF L>5 THEN 170
200 PRINT: PRINT"CAR"C"IN
    LAP"L"WENT"S(C,L)"MPH"
```

In this case, the DIM statement is optional, since the computer will automatically dimension arrays of 11 or fewer elements. Lines 20–50 contain nested FOR-NEXT loops that read 20 speeds from the DATA statements and dutifully tuck them away into our 4 × 5 element array.

In lines 140 and 170, the user is asked for the car and lap number; lines 150, 160, 180, and 190 check for valid input. If the user wanted to know the speed of the second car's third lap (C=2, L=3), the computer would go to pigeonhole S(2,3) to get that information. In this case, the speed is 116, which is printed in line 200.

How would you get the program to calculate the average speed for each car? Would that exercise use arrays? We'll see next month.

One last example: We'll roll one die 15 times and stick the results into a one-dimensional array. You could use this code in a game.

```
10 DIM T(15)
20 FOR J=1 TO 15
30 T(J)=INT(6*RND(1))+1
40 PRINT T(J)
50 NEXT
```


Save 55% On Gazette Disk!

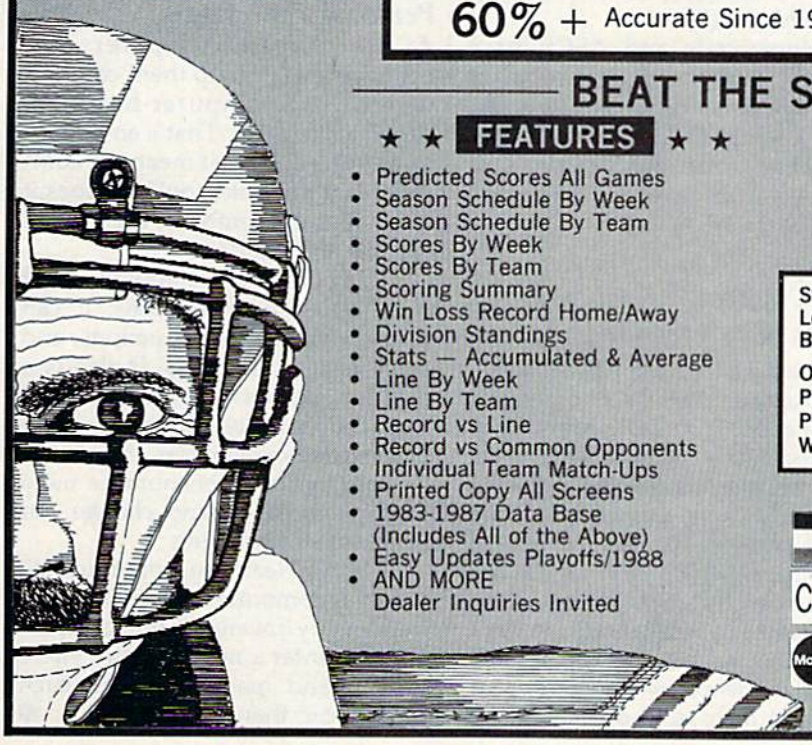
A full-year subscription includes over 100 ready-to-run programs. Now only $69.95—a 55% savings off single-issue price.

To order, call toll-free
1-800-727-6937

PIK'EM 88

★ ★ ★ ★

A Complete Pro Football Prediction Program For The 1988 NFL SEASON



60% + Accurate Since 1982

More In '88 To . . . . . .

BEAT THE SPREAD

★ ★ **FEATURES** ★ ★

- Predicted Scores All Games
- Season Schedule By Week
- Season Schedule By Team
- Scores By Week
- Scores By Team
- Scoring Summary
- Win Loss Record Home/Away
- Division Standings
- Stats — Accumulated & Average
- Line By Week
- Line By Team
- Record vs Line
- Record vs Common Opponents
- Individual Team Match-Ups
- Printed Copy All Screens
- 1983-1987 Data Base (Includes All of the Above)
- Easy Updates Playoffs/1988
- AND MORE

Dealer Inquiries Invited

64.95 INCLUDES DISK AND DOCUMENTATION

- IBM, Tandy & Compatibles
- Commodore 64 — 128
- Apple II+ — IIc — IIe — IIgs

Stats Needed To Run Program Available In Local Newspapers Or We Will Furnish All Stats By 1st Class Mail. Season Price 40°°.

Our Bulletin Board Will Furnish All Stats, Lines, Predictions and Trends Updated Daily. Season Price 55°°. Program Comes Updated Thru Current Week of Season . . . No Extra Charge.

VISA C.O.D. MasterCard

ORDERS SHIPPED IN 2 DAYS
PHONE LINES OPEN 24 HRS.
ADD 3°° SHIPPING & HANDLING

TOLL FREE — 800-722-2277
INFORMATION — 214-586-8212

MARATHON SOFTWARE DEPT. 2
P. O. BOX 1349 — 641 FORT WORTH ST.
JACKSONVILLE, TEXAS 75766
TOLL FREE FOR ORDERS ONLY

Counting People and Making Faces

Rhett Anderson
Assistant Editor

Imagine the largest possible counting jobs. Counting the grains of sand on a beach. Counting the stars in a galaxy. Counting the atoms in a gallon of milk.

It was just such a monumental counting job—tabulating the 1950 U.S. Census—that inspired the first commercial computer. The machine, UNIVAC I, certainly *looked* up to the task. If you ever saw a photo of it, you wouldn't question that for a moment. It was, simply put, huge. Even the bold letters **UNIVAC** were intimidating.

Although it's about the size of a small typewriter, your Commodore 64 is vastly more powerful than the UNIVAC I.

Today it's easy to take computers for granted. But what would you be doing with your leisure time if there were no personal computers?

Ham Radio

You may be familiar with the *chat* mode available on commercial telecommunications services. No matter what you want to discuss, you can probably find someone online with the same interest.

Chat mode has been called "The Great Equalizer"—you don't know the name, age, sex, race, or religion of the person on the other end of the modem (unless the person is willing to tell you). About all you can safely bet is that he or she is willing to use a computer.

Chat mode was inspired by CB radios, which in turn were inspired by ham radios. Ham radios were the leading edge of technology in the early part of the century.

Like computerists, early ham radio operators had their own heros. Tesla and Marconi, the inventors of the technology, were revered. In the computer world, it's names such as Boole and Babbage that we've heard over and over. And others, too. Mauchley and Eckert (makers of the UNIVAC and the earlier ENIAC), and Von Neumann (inventor of the stored-program concept).

Talk Like This

Ham radio users had their own language. To gain a ham radio license, you needed to learn the series of dots and dashes that make up letters, words, and sentences communicated in Morse code. Morse code was borrowed from an older technology, the telegraph. Telegraph operators had originated, relayed, and transmitted Morse code messages at speeds that changed the world. With telegraph and radio, news traveled at the speed of light.

Early computer users learned ASCII, the code that specifies which values in the computer stand for which characters. Most people learned only the most important characters: A space is 32, the alphabet starts with 65 (A), the numerals start with 48 (0).

Morse code and ASCII have much in common. Both are binary (base 2). Morse code uses dots and dashes, while ASCII uses 0s and 1s. In Morse Code, SOS (Save Our Ship—a standard distress call) looks like this:

```
. . . - - - . . .
```

In ASCII, it's

```
01010011 10001111 01010011
```

You'll notice that the ASCII SOS is much longer than the one given in Morse code. That's OK. Morse code was designed to be used by humans, who send one dot (short pulse) or one dash (long pulse) at a time. ASCII was designed for use by computers, which typically access memory eight bits at a time.

Today, people who listen to radio don't have to know Morse code. Likewise, people who use computers don't have to know ASCII.

Making Faces

You may think that chatting over a computer is unnatural, but what if you knew that telecommunicators have begun to make faces at each other? Here's a face.

```
:)
```

If you don't see it, give your head a tilt to the left (or the magazine a tilt to the right). It's a smiling face—two eyes and a mouth. How about this one?

```
;)
```

That's a wink.

So if you're online and you see apparently random punctuation, someone may be making a face at you:

:(	**a frown**
8-o	**a look of astonishment**
:*	**a kiss**
:p	**sticking out a tongue**
:>	**a mischievous grin**

If you know more faces, please send them to Horizons, P.O. Box 5406, Greensboro NC 27403.

Personal Computers

As we've seen, computers can count people or help them communicate. The computer has been called a *mind tool.* That's an ambiguous phrase. Does it mean the computer is a mindlike tool? Or does it mean that the computer is a kind of tool for the mind?

It's both. It's certainly the most mindlike of all inventions. It can play chess, follow instructions, and solve logical problems. It also is a tool for the mind. It's so fast and versatile that it can fill in for other tools such as calculators and clocks. Its very existence encourages us to inspect, consider, and change our own ways of thinking.

As we learn to communicate with our computers (and with other humans by means of our computers), we enter a new domain where human and machine enrich each other more than ever before.

the programmer's page

Did You Know That . . .

Randy Thompson
Contributing Editor

"The Programmer's Page" is interested in your programming tips and tricks. Send all submissions to The Programmer's Page, **COMPUTE!'s Gazette,** *P.O. Box 5406, Greensboro, North Carolina 27403. We'll pay $25–$50 for each tip we publish.*

Did you know that the 64 doesn't care whether it's a number or a string that's put between the parentheses in a PEEK function? Did you know that GOTO without a line number jumps to program line 0? Did you know that by using CONT within a BASIC program you put the computer in an infinite loop? Did you know that CMD stands for Change Main Device?

In the never-ending quest for complete understanding, I've compiled a list of several interesting, if not useful, pieces of programming trivia. Here are just a few. (Unless otherwise stated, the following examples work on all Commodore eight-bit computers.)

PEEKing Strings

Yes, it's true. You can PRINT PEEK(A$) on the 64 without invoking a syntax error. In fact, you can PRINT POS(A$) with the same syntactical immunity.

The number returned by a PEEK(A$) depends on the last numeric operation performed. For example, the code X=197:PRINT PEEK(A$) is equivalent to PRINT PEEK(197).

You can place a string literal inside the parentheses as well—like PRINT PEEK("HELLO")—but the value returned is always the contents of memory location 0. When you execute a PEEK("*string literal*") three times in a row, the computer, in a response quite different from its reaction to string variables, halts with a FORMULA TOO COMPLEX error. But what do you expect when you start putting characters where numbers belong?

The First Dimension

When it comes to Commodore BASIC, 11 elements are standard.

For example, without performing any prior DIM statements, you can enter the following code without receiving a BAD SUBSCRIPT error: A(10)=64.

This works because all undimensioned arrays—string or numeric—are automatically initialized to 11 elements (0–10) when accessed for the first time. In fact, after the above code has been executed, DIM A(10) provokes a REDIM'D ARRAY error, even though you never actually dimensioned the array.

Immortalized in Silicon

Painters brush their names on canvas; vandals spray their names on walls; programmers and hardware designers burn their names into ROM chips. To find the names hidden within the 128, try entering this command from 128 mode: SYS 32800,123,45,6.

How Much Is a Period Worth?

How much is a period (.) worth? Nothing. Or more accurately, 0. Wherever you use the digit 0 all by itself, you can replace it with a period. BASIC even interprets the period faster than it does the digit 0. In other words, the program

```
10 POKE 53281,.:POKE 53281,1:GOTO 10
```

executes faster than

```
10 POKE 53281,0:POKE 53281,1:GOTO 10
```

Incompatible Twins

All programmers are familar with BASIC's GOTO command, but did you know that GOTO can be broken into two separate words: GO and TO? The command GOTO 100 works the same as GO TO 100.

Although more grammatically correct, GO TO is almost never used, and for good reason. Not only does GO TO take up two more bytes of memory—one extra space plus the additional token—but it isn't truly compatible with its more compact sibling, GOTO.

For example, while the command ON X GOTO 100,200,300 is a perfectly legal BASIC instruction, ON X GO TO 100,200,300 is not.

The same is true of IF X=0 GOTO 100 and IF X=0 GO TO 100. The first example works just fine, while the latter produces an error.

A Missing Parameter

The MID$ function requires three parameters—or does it? Without the third parameter, MID$ returns all the characters to the right of, and including, the character specified by the second parameter. In the example LN$=MID$("WALTER HEGO",7), LN$ is set equal to the last name HEGO.

This shortened version of MID$ is useful when you want to perform a RIGHT$ but don't know *how many* characters you need—just *where* in the string the characters begin.

Abbreviated BASIC

While this last tip may be fairly well known, it's so useful that it deserves to be mentioned here.

Almost all BASIC commands may be abbreviated. For example, the abbreviation for PRINT is a question mark (?). Command abbreviations can save you a lot of typing. They also allow you to cram more commands on a program line.

To see the complete list of command abbreviations, refer to the Commodore 64 *User's Guide,* Appendix D; the 128 *System Guide,* Appendix K; or *The Programmer's Reference Guide for the Commodore Plus/4* (from Scott, Foresman and Company), page 11.

machine language programming

Jim Butterfield
Contributing Editor

Few of us write perfect programs. If a program is not perfect, it needs fixing. The process of fixing errors, or *bugs*, in a program is known as *debugging*. Here are some hints on how to debug your machine language programs.

For most beginners, debugging machine language code is harder than debugging BASIC. For one thing, the RUN/STOP key doesn't seem to work with machine language (although you can make it work; more on that in a moment). Some errors make the machine "lock up." It also seems hard to stop a program at a certain point to see how it has behaved so far; this stop-and-check activity is the heart of serious debugging.

Let's write a simple program with an intentional error. The program to be debugged is a classic—it prints *HELLO, WORLD!*.

We'll put our code at address $2000. That's not the best place to put ML programs for long-term safety, but this address area is available on virtually all eight-bit Commodore machines. We'll use a simple machine language monitor to enter the commands. Some computers have a built-in monitor; with others you'll need to load one in. You may find a monitor hidden away on your assembler disk.

Hello, World!

Here's the plan: We will count the characters as we output them, using the X register. *HELLO, WORLD!* contains 14 characters (including a RETURN character), so at the bottom of the loop we will test for a value of 14 and loop back if X is low. We must put the message somewhere nearby—say, $2030.

We normally put characters into memory by displaying memory and then typing over the old values with new ones (just the way we edit a line in BASIC). Type M 2030 203D for a display of memory starting at 2030 (monitors use hexadecimal numbers). Now move the cursor back and type over the two-digit values so that the display looks like this:

```
>2030  48  45  4C  4C  4F  20  57  4F:
>2038  4F  52  4C  44  21  0D  00  00:
```

Be sure to press RETURN after you have filled in each line. Your machine language monitor may also show the characters that make up *HELLO, WORLD!*.

Remember that what we have just done is to supply data to the computer. These are *not* instructions, so we don't need to assemble them. But our next job is to write the program instructions, so use the monitor's A (assemble command) and type

```
A 2000 LDX #0
```

When you press RETURN, the instruction is translated into machine language. Your monitor may assume that you want to assemble more instructions. So it may type in part of the next line for you (A 2002). As for the actual instruction we entered, LDX #0 means load register X with the actual value of 0 (not the contents of memory location 0).

```
A 2002  LDA  $2030,X
A 2005  JSR  $FFD2
```

These instructions print a character. Now, let's activate the RUN/STOP key. We're inside a loop, so if somehow we get caught inside the loop, at least we'll be able to stop the program. The subroutine at $FFE1 will do the trick:

```
A 2008  JSR  $FFE1
A 200B  BEQ  $2013
```

When I wrote this program, I first gave a dummy value for the destination of the BEQ instruction. Later, when I knew where I was going to branch, I filled in the correct value.

Now I'll do something odd. I'll put in an instruction that does nothing. You'll see later how this helps.

```
A 200D NOP
```

A Bad Seed

Next comes our bug. We intended to use X to count the number of characters we sent. The proper command here would be INX, or increment X. We're going to blunder completely and type in an INY command. Since we're counting with the wrong register, X will never reach 14. Here goes:

```
A 200E INY
```

The remaining code tests the count for 14 (hex E) and either loops or exits:

```
A 200F  CPX  #$0E
A 2011  BNE  $2002
A 2013  RTS
```

Leave the monitor with command X, call the machine language program with SYS 8192, and you have . . . a *mess*.

The RUN/STOP key works, since we had the foresight to test for it within our loop. It's a good practice; think about it. Press RUN/STOP and the program stops. Now let's see why all those *H* characters went to the screen.

Back in the monitor, we change that NOP instruction to BRK to stop the program when it reaches here. (Type D 2000 and type over the NOP command with BRK, pressing RETURN.) Try the program again.

Aha! The program prints *H* and breaks to the monitor. Register X contains 0, as it should. Continue with G 200E (go to the next instruction); the 128 needs G F200E to keep the computer in bank 15.

Trouble: The program prints *H* again, and X still contains 0. How could that be—we're incrementing X, aren't we? No. We see that we incremented Y. Bug caught!

the geos column

Quick Clock

Ernest R. Hunter

***Time flies when you use this improved* GEOS *timepiece. The new clock's features include a larger display and an improved user interface. For 64 or 128* GEOS.**

The *GEOS* environment comes with two desk accessories that let you set and view the time. The first of these is the preference manager, which also lets you set other system variables, such as the screen colors and the speed of the mouse pointer. The other is the alarm clock.

Neither of these desk accessories is ideal. Both require that you click in the appropriate area before typing in the time. Both display the time in a small font. The alarm clock allows you to set the time, but not the date.

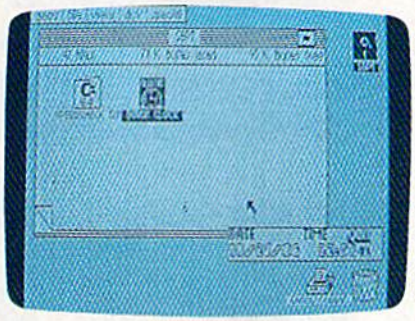
"Quick Clock" is a new desk accessory with new features. It displays the time and date in large characters. Setting the time and date with Quick Clock is a breeze. No clicking is involved—just move the pointer over the labels TIME or DATE to set the time or date. (Windows which are activated by simply moving a pointer over them are often called *sun windows*. The name comes from Sun workstations, which have such windows.)

Typing It In

Like all *GEOS* desk accessories, Quick Clock is written in machine language. Type it in with "MLX," the machine language entry program found elsewhere in this issue. (Commodore 128 users must be in 64 mode when typing in the listing.) When MLX prompts you, respond with these values:

Starting address: 5A00
Ending address: 5E97

Type in the data for Program 1, "Quick Clock." When you've finished typing, save two copies of the



program to a *GEOS* work disk, one with the name CLOCK.ML, the other with the name QUICK CLOCK. One of these files will be converted with GeoConverter; the other will remain in MLX format.

Now type in Program 2, "GeoConverter." (Again, 128 users must be in 64 mode.) Use "The Automatic Proofreader" when you enter this program. GeoConverter is used to make Quick Clock into a *GEOS* file. Save a copy of GeoConverter to your *GEOS* work disk.

Now, run Program 2. You'll be prompted for a filename. Type QUICK CLOCK. GeoConverter converts your file into a *GEOS* file.

A Good Time

Open Quick Clock by choosing it from the Desk Accessories menu or by double-clicking its icon. Quick Clock opens in the bottom right corner. On the top line you'll see three activation labels: DATE, TIME, and QUIT. Move the mouse pointer over TIME. Now enter the time by typing it in 24-hour format. For example, if it's 9:25 and 12 seconds a.m., type 09:25:12. If it's 9:25 and 12 seconds p.m., type 21:25:12. Be sure to enter the colons.

Now set the date. Move the pointer over DATE. Quick Clock expects the date in the form mm/dd/yy. If it's May 3,1988, type 05/03/88. If you change the time by more than 12 hours, Quick Clock advances the date. If this is not what you intended, enter the date again. To quit Quick Clock, move the mouse pointer to QUIT.

See program listings on page 72.

COMPUTE! Publications

Back Issues/ Disk Orders

Individual back copies of *magazines* and *disks* are available by mail only while quantities last.

Please clip or photocopy and mail completed coupon and check to:

COMPUTE!'s Gazette
Single-Copy Sales
P.O. Box 5188
Greensboro, NC 27403

Name: _____

Street: _____

City: _____

State: _____ Zip: _____

Type of computer: _____

Quantity	Issue (Month/Year)	Magazine or Disk Name	Price*

SUBTOTAL:
NY—Add 8¼% Tax:
NC—Add 5% Tax:
TOTAL:

* Back issues of COMPUTE!, COMPUTE!'s Gazette, and Apple Applications are $5.00 each. The following issues are **NOT** available. **COMPUTE:** 9/81, 11/81, 2/82–12/82, 2/83, 4/83, 1/85. **GAZETTE:** 10/83, 1/84, 3/84–6/84, 9/84, 12/84,1/85–7/85, 10/85.
* Single disks for COMPUTE!, Gazette, or Apple Applications are $15.00. NOTE: No disks dated prior to January 1986 are available.
* Back issues of COMPUTE!'s PC Magazine and Atari ST Disk & Magazine are $16.00 each. (These publications are available only as magazine/disk combinations.) The following issues are **NOT** available. **PC Magazine:** 9/87. **Atari ST Disk and Magazine:** 10/86, 12/86.
* Disk and magazine combinations are $16.00.

Shipping and handling included.
NO CREDIT CARD ORDERS ACCEPTED.
Payment must be in U.S. dollars by check drawn on U.S. bank.

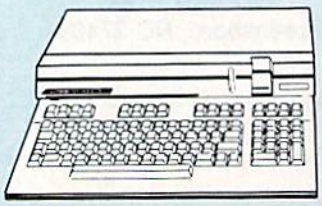
Lyco Computer

Marketing & Consultants

Since 1981

Air orders processed within 24 hours.

COMMODORE 128D



$439.95

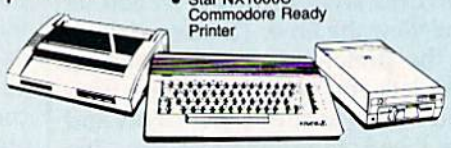
COMMODORE HARDWARE

64C Computer	$159.95
C128D Computer/Drive	$439.95
1541 II Disk Drive	$175.95
1581 Disk Drive	$189.95
Excel 2001 C128 Drive	$199.95
Excel FSD-2+ C64 Drive	$149.95
1802C Monitor	$189.95
1084 Monitor	$299.95
C1351 Mouse	$39.95
1700 RAM	$109.95
1764 RAM C64	$117.95
Colt PC	$CALL

COMMODORE 64C System Special

$479.95

- Commodore 64C Computer
- Excel FSD-2 Disk Drive
- Star NX1000C Commodore Ready Printer



COMMODORE COLT PC

- IBM PC Compatible
- 640K Std.
- Two 5¼ Drives Std.
- Expansion for Hard Drive
- Turbo Processor
- MSDOS + GW Basic Included
- Serial + Parallel Ports
- Mono/RGB Color Card Included

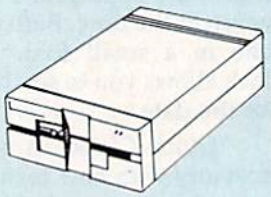
$689.95

PC COMPATIBLE HARDWARE

Laser Compact PC XT	$469.95
Laser Compact XTE 640K	$549.95
Laser Desktop Turbo XT 256K	$569.95
Laser Desktop Turbo XT 640K	$599.95
Blue Chip PC XT	$CALL
Blue Chip Popular	$CALL
Blue Chip 286AT	$1059.95
Vendex Headstart Color	$989.95
Vendex Headstart Mono	$CALL
Vendex Headstart 888 LTD Color	$1599.95
Sharp PC 4501	$679.95
Sharp PC 4502	$1239.95
Zucker CGA ColorCard	$89.95
BCC CG ColorCard	$94.99
Laser EGA + 4 Card	$129.95
ATI Graphics Solution	$129.95
ATI EGA Wonder	199.95
Thomson GB200 ColorCard	$184.95
ATI VIP	$299.95
Kraft PC Joystick Card	$27.95

Excel 2001 Disk Drive for C128D

- Faster, quieter, more reliable than the 1571
- Fully compatible
- Separate power supply, so drive remains cool



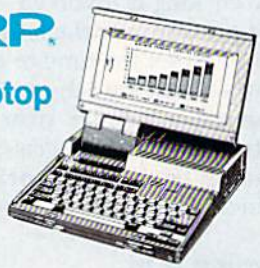
$199.95

LASER COMPACT XT

- PC-XT Compatible
- 4.77 - 8.00 Mhz Super Turbo Clock Speed
- Built-in 5¼ Drive
- Built-in RGB Video Output
- Parallel Printer Port
- Serial RS232
- Joystick/Game Port

ONLY $475.95

SHARP PC-4501 Laptop



$699.95

Color System HEADSTART by Vendex

- Ready to plug in and use immediately
- Ultra fast 8 Mhz Intel 8088-2 Processor
- 512K RAM memory expandable to 768K
- 2-360K disk drives standard
- First complete system with clock calendar and built-in ports for printer, RS232, 2 joysticks, mouse and light pen
- Includes $500 worth FREE software programs
- Hi Res color monitor included!

$1049.95

Seagate HARD DRIVES

ST 225 20 meg Hard Drive	$215.95*
ST 251 40 meg Hard Drive	$349.95*
*DTC Controller Kit for PC/XT	$39.95
ST 238 30 meg Hard Drive	$245.95**
**DTC RLL Controller Kit for PC/XT	$49.95
ST 125 20 meg 3.5 Hard Drive	$239.95
DTC Controller Kit for PC/XT	$39.95
ST 125 20 meg Internal Card w/Controller	$329.95

Add $10.00 for Western Digital Controllers

BLUE CHIP 286AT

New Release!

$1059.95

Green, Amber & Color Monitors Available.

1-800-233-8760

Lyco Computer

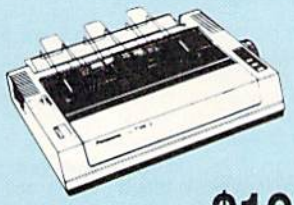
Marketing & Consultants

Since 1981

Air orders processed within 24 hours.

Panasonic Office Automation

The easier the better!



Panasonic Office Automation

1091i Model II

- 192 cps Draft
- 32 cps NLQ

$195.95

Panasonic Office Automation

3131

Daisy Wheel Printer

- 17 cps Speed
- Up to 13.5 Paperwidth
- Bidirectional
- Uses Standard Diablo Wheels
- 2-Year Warranty

$299.95

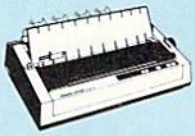
Panasonic Office Automation

1092i

- 240 cps
- 48 cps NLQ
- Adjustable Push Tractor

$319.95

Panasonic Office Automation

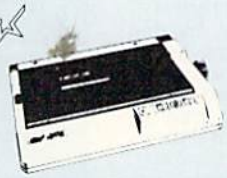


1592

- 136 Column
- 180 cps
- NLQ in all Pitches
- Pushtractor
- 2-Year Warranty

$409.95

star micronics



Star NX1000C

- 144 cps Draft
- 36 cps NLQ
- EZ Front Panel Control
- Commodore Direct Connect

$179.95

NEW! NX1000C Rainbow $229.95

star micronics

Improve your image with a Star!

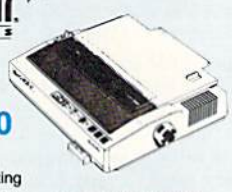
star micronics

NX15

- 120 cps Draft
- 30 cps NLQ
- 136 Column Width
- Auto Paper Feed

$309.95

star micronics



NB2410

- 24 Pin High Quality Printing
- 216 cps Draft
- 72 cps Letter Quality

$399.95

star micronics

NR10

- 240 cps Draft
- 60 cps NLQ
- EZ Front Panel Control

$339.95

1-800-233-8760

Lyco Means Total Service

Avatex 1200e

Dis

Mark "Mac" Bowser, Sales Manager

I would personally like to thank all of our past customers for helping to make Lyco Computer one of the largest mail order companies and a leader in the industry. Also, I would like to extend my personal invitation to all computer enthusiasts who have not experienced the services that we provide. Please call our trained sales staff at our toll free number to inquire about our diverse product line and weekly specials.

Call Lyco

First and foremost our philosophy is to keep abreast of the changing market so that we can provide you with not only factory-fresh merchandise but also the newest models offered by the manufacturers at the absolute best possible prices. And we offer the widest selection of computer hardware, software and accessories.

Feel free to call Lyco if you want to know more about a particular item. I can't stress enough that our toll-free number is not just for orders. Many companies have a toll-free number for ordering, but if you just want to ask a question about a product, you have to make a toll call. Not at Lyco. Our trained sales staff is knowledgeable about all the products we stock and is happy to answer any questions you may have. We will do our best to make sure that the product you select will fit your application. We also have Saturday hours — one more reason to call us for all your computer needs.

Order Now

Once you've placed your order with Lyco, we don't forget about you. Our friendly, professional customer service representatives will find answers to your questions about the status of an order, warranties, product availability, or prices.

Lyco Computer stocks a multimillion dollar inventory of factory-fresh merchandise. Chances are we have exactly what you want right in our warehouse. And that means you'll get it fast. In fact, orders are normally shipped within 24 hours. Free shipping on prepaid cash orders over $50, and there is no deposit required on C.O.D. orders. Air freight or UPS Blue/Red Label shipping is available, too. And all products carry the full manufacturers' warranties.

Here's How

I can't see why anyone would shop anywhere else. Selection from our huge in-stock inventory, best price, service that can't be beat — we've got it all here at Lyco Computer.

TO ORDER, CALL TOLL-FREE: 1-800-233-8760
New PA Wats: 1-800-233-8760
Outside Continental US Call: **1-717-494-1030**

Hours: 9AM to 8PM, Mon. - Thurs.
9AM to 6PM, Friday — 10AM to 6PM, Saturday

For Customer Service, call 1-717-494-1670,
9AM to 5PM, Mon. - Fri.
Or write: Lyco Computer, Inc.
P.O. Box 5088, Jersey Shore, PA 17740

Attention Educational Institutions:

If you are not currently using our educational service program, please call our representatives for details.

C.O.D. Risk-Free Policy: • full manufacturers' warranties • no sales tax outside PA • prices show 4% cash discount; add 4% for credit cards • APO, FPO, international: add $5 plus 3% for priority • 4-week clearance on personal checks • we check for credit card theft • sorry, compatibility not guaranteed • return authorization required • due to new product guarantee, return restrictions apply • price/availability subject to change • prepaid orders under $50 in Continental US, add $3.00

MasterCard VISA

Hayes Compatible Modem

$69.95*

- Direct Connect Cable to Your C64/128
- 1200 Baud

* With Purchase of Cable Kit

Disc Storage

QVS-10 5¼	$3.95
QVS-75 5¼	$10.95
QVS-40 3½	$9.95

Printer Ribbons

Save up to 50%! We carry a stock of thousands for most applications.

Printer Interfaces

Xetec Jr.	$35.95
Xetec Supergraphics	$55.95
Xetec Gold	$74.95
PPI	$29.95
Cardco GWhiz	$32.95
Cardco Super G	$44.95
MW 350	$49.95

We carry cables for most printer applications for many popular computers.

Great Bargains

New M-3 Mouse

- Works with Geos
- 1351 Compatible
- Less Expensive than 1351!

$34.95

Mouse Care Kit

— Includes —

Mouse Pad

- 9" x 11" Size
- Provides Clean, Dust-Free Surface for Your Mouse
- No-Mar Backing to Protect Your Desk Surface

Mouse Cleaning Ball

- Maintains Optimum Mouse Performance!

Only $19.95

Items can be purchased separately.

5-1/4

Disk Notcher

Maxell:
SSDD .....
DSDD .....

Bonus:
SSDD .....
DSDD .....

SKC:
DSDD .....
DSHD .....
Generic DSDD

Verbatim:
SSDD .....
DSDD .....

3.5

Maxell:
SSDD .....
DSDD .....

Bonus:
SSDD .....
DSDD .....

Verbatim:
SSDD .....
DSDD .....

SKC:
SSDD .....
DSDD .....

Joys

Tac 3 .....
Tac 2 .....
Tac 5 .....
Tac 1 + IBM/A
Slik Stick .....
Black Max .....
Boss .....
3-Way .....
Bathandle .....
Winner 909 ....
Wico IBM/AP ..
Lipstick Plus ..
Kraft KC III Ap
Kraft PC Joysti
Card .....
Kraft Maze Ma
I Controller .....
Epyx 500 XJ ..

Pri Pa

1000 sheet las
1000 mailing la
200 sheet OKI
Transparent La
Banner Paper 4

C Power

Micro MW

$34

1-Year W

Free shippin

SORIES

SOFTWARE

kettes $5.95
..... $7.95
..... $8.95
..... $5.95
..... $6.95
..... $6.95
..... $13.95
..... $4.95
..... $8.99
..... $11.50
..... $11.50
..... $17.95
..... $10.95
..... $13.95
..... $12.95
..... $18.95
..... $9.95
..... $13.99

ticks

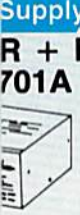
..... $9.95
..... $10.95
..... $12.95
P $26.95
..... $6.95
..... $10.95
..... $11.99
..... $19.99
..... $16.75
..... $24.95
..... $29.95
..... $14.95
PC $16.95
k
..... $27.95
ter $8.95
..... $13.95
..... $13.95

nter per

r $16.95
els $8.95
20 ..... $8.95
els $4.95
5' Roll . $10.95

64 Supply

R + D
701A



.95
Warranty

Surge Suppressors

PP102-6 outlet $16.95
PP106-6 outlet with EMI/RFI $28.95
PP104-6 outlet with indicator $19.95
PP101-6 outlet powerstrip $9.95
Modem Protector $10.95

Drive Maintenance

5¼ Drive Cleaner CMP142 ..... $7.95
5¼ Drive Cleaner with program $15.95
3.5 Drive Cleaner CMP 154 ..... $10.95

Switch Boxes

Cent '25' AB $39.95
Cent '36' AB $39.95
RS232 ABC $45.95
Cent ABC $49.95
RS232 ABCD $49.95
Cent ABCD $49.95

Video Tape

SKC T120 VHS Video Tape:

each $3.99
3 pack $10.95
10 pack $35.95

Bargain Basement

Here are opportunities to enjoy below cost savings on items currently not in production due to newer replacement models. Call for updated product list.

COMMODORE

Access:
Echelon $25.95
Mach 5 ..... $19.95
Mach – 128 ..... $28.95
10th Frame $22.95
Triple Pack $11.95
Wld. Cl. Leader Brd. ... $22.95
Famous Courses #1 ... $11.95
Famous Courses #2 ... $11.95
Leader Board Pack $12.95

Action Soft:
Up Periscope $18.95
Thunderchopper $18.95

Activision:
Champion. Basketball . $19.95
Music Studio $19.95

Leather Goddesses $19.95
Top Fuel Eliminator $17.95
Beyond Zork $25.95
GFL Football $19.95
Gee Bee Air Rally $17.95
Last Ninja $19.95
Might & Magic $22.95
Aliens $19.95
Maniac Mansion $19.95
Ghostbusters $9.95

Batteries Included:
Paperclip III $31.95
Outrageous Pages $31.95

Berkeley Softworks:
Geofile C64 ..... $29.95
Geocalc C64 ..... $29.95
Geopublish C64 ..... $39.95
Geos 64 ..... $35.95
Geowrite $29.95
Geos 128 ..... $39.95
Geowrite 128 ..... $39.95
Geocalc 128 ..... $39.95
Geofile 128 ..... $28.95
Berkeley TriPak $29.95

Broderbund:
Bank St. Writer $29.95
Carmen San Diego $20.95
Graphic Lib. I, II, III $14.95
Print Shop $26.95
Print Shop Compan. $20.95
Cauldron $17.95
Superbike Challenge ... $12.95
Magnetron $15.95

Electronic Arts:
Roadwars $19.95
Hunt for Red October .. $25.95
Patton vs. Rommel $19.95
Skyfox II $19.95
Tobruk–Clash of Armor $19.95

Epyx:
Fastload $22.95
Winter Games $11.95
California Games $22.95
Str. Sports Basketball . $22.95
Summer Games II $11.95
World Games $22.95
Rad Warrior $13.95
Death Sword $11.95
Impossible Mission 2 ... $22.95
The Games: Winter Edition $22.95

Firebird:
Elite $9.99
Guild of Thieves $25.95
Pawn $9.99
Tracker $11.95
Starglider $18.95
Sentry $22.95

Microleague:
Microleag. Baseball $22.95
General Manager $16.95
Stat Disk $13.95
Microleag. Wrestling $16.95
'87 Team Disk $11.95

Microprose:
Airborne Ranger $22.95
F-15 Strike Eagle $19.95
Gunship $19.95
Kennedy Approach $13.95
Silent Service $19.95
Solo Flight $13.95
Top Gunner $13.95
Pirates $22.95
Stealth Fighter $22.95

Mindscape:
Infiltration $16.95
Infiltration 2 ..... $16.95
Paperboy $19.95

Origin:
Autoduel $29.95
Ultima III $23.95
Ultima IV $34.95
Moebius $23.95

Software Simulations:
Pure Stat Baseball $22.95
Football $17.95
Pure Stat College Basketball $22.95

Springboard:
Newsroom $19.95
Certificate Maker $14.95
Clip Art Vol. #1 ..... $12.95
Clip Art Vol. #2 ..... $12.95
Clip Art Vol. #3 ..... $12.95
Graphics Expander $21.95

Strategic Simulations:
Gettysburg $33.95
Phantasie II $22.95
Phantasie III $22.95
Wizards Crown $22.95
Wargame Constr. $16.95
Battlecruiser $33.95
Eternal Dagger $22.95
Questron II $22.95
Phantasie $22.95

Sublogic:
Flight Simulator II $30.95
Jet Simulator $30.95
Night Mission Pinball ... $19.95
Scenery Disk 1-6 ..... $12.95
Stealth Mission $30.95

Timeworks:
Partner C64 ..... $22.95
Partner 128 ..... $27.95
Swift Calc 128 ..... $27.95
Wordwriter 128 ..... $27.95
Wordwriter 3 64 ..... $22.95
Silvia Porter Vol. 1-64 . $CALL

Unison World:
Art Gallery 1 or 2 ..... $14.95
Print Master $17.95
Art Gallery Fantasy $13.95

AMIGA

Access:
World Class Lead. Bd. . $CALL

Activision:
Champ. Basketball $25.95
GFL Football $25.95
Gee Bee Air Rally $22.95

Electronic Arts:
Weaver Baseball $33.95
Return to Atlantis ..... $CALL
Ferrari Formula One ... $33.95
Hunt for Red October .. $33.95

Epyx:
Apshai Trilogy $11.95
Winter Games $11.95
World Games $22.95
Destroyer $22.95

Firebird:
Guild of Thieves $25.95
Pawn $13.95
Starglider $25.95

Microprose:
Silent Service $22.95

Sublogic:
Flight Simulator II $31.49
Scenery Disk ..... $CALL

Unison World:
Print Master $25.95
Art Gallery 1 or 2 ..... $14.95
Fonts & Borders $17.95
Art Gallery Fantasy $13.95

IBM

Access:
Wld. Cl. Leader Board . $27.95
10th Frame $27.95

Activision:
Champ. Baseball $22.95
Champ. Basketball $22.95
Zork Trilogy $27.95
Leather Goddesses $22.95
Beyond Zork $27.95

Broderbund:
Ancient Art of War $26.95
Print Shop $34.95
Print Shop Compan. $29.95
Graphic Lib. I or II $19.95
Ancient Art of War at Sea $26.95
Carmen San Diego World $23.95
Superbike Challenge ... $12.95
Search and Destroy $9.95

Electronic Arts:
Yeager's AFT $26.95
Hunt for Red October .. $31.95
Alternate Reality-City .. $25.95

Epyx:
Create A Calendar $15.95
Destroyer $22.95
Winter Games $11.95
World Games $22.95
Rad Warrior $13.95
Spy vs. Spy III $13.95
California Games $22.95
Death Sword $11.95
Impossible Mission 2 ... $22.95

Firebird:
Knight Orc $25.95

Microleague:
Microleag. Baseball $22.95
General Manager $16.95
Stat Disk $13.95

Microprose:
Conflict in Vietnam $22.95
Crusade in Europe $22.95
Decision in Desert $22.95
F-15 Strike Eagle $22.95
Silent Service $22.95
Gunship $27.95
Pirates $22.95

Mindscape:
Harrier Combat Simulator $19.95
Gauntlet $22.95

Origin:
Ultima I $23.95
Ultima III $23.95
Ultima IV $34.95
Moebius $34.95
Ogre $17.95

Strategic Simulations:
Stellar Crusade $28.95
Sons of Liberty $22.95
Road War Europa $22.95

Sublogic:
Jet Simulator $30.95
Flight Simulator $34.95

Timeworks:
Swiftcalc $22.95
Wordwriter $27.95

Unison World:
Art Gallery 2 ..... $14.95
Newsmaster II $39.95
Print Master (+) $29.95
Fonts & Borders $17.95

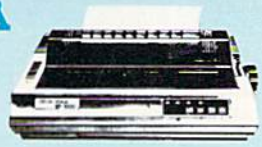
g on Prepaid cash orders over $ 50 in the Continental U.S.

Price Guarantee

Since 1981, we have led the industry by continuing to offer the lowest national prices while providing quality service. Many companies have come and gone trying to imitate our quality and service. If by some oversight we do not have the lowest prices advertised on the products you desire, then we would appreciate the opportunity to rectify this oversight.

Commodore Ready

SEIKOSHA Sp 180VC



- 100 cps Draft
- 20 cps NLQ
- Direct Connect for Commodore

Quantities Limited

$129.95

Monitors

Thomson:

230 Amber TTL/12"	$69.95*
4120 CGA	$219.95
4160 CGA	$244.95*
GB 100	$119.95*
GB 200 Super Card	$169.95*
4570	$399.95

**Quantities Limited*

Blue Chip:

BCM 12" Green TTL	$64.95
BCM 12" Amber TTL	$69.95

NEC

Multisync II	$589.95

Modems

Magnavox:

BM7652	$79.95
BM7622	$79.95
7BM-613	$79.95
7BM-623	$79.95
CM8502	$179.95
CM8505	$199.95
9CM-053	$CALL
CM8762	$239.95
8CM-515	$259.95
CM9043	$CALL
8CM-873	$499.95

Avatex:

1200e	$69.95
1200i PC Card	$65.95
1200hc Modem	$69.95*
2400	$149.95
2400i PC Card	$139.95

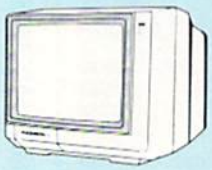
**w/cable purchase*

Hayes:

Smartmodem 300	$139.95
Smartmodem 1200	$279.95
Smartmodem 2400	$419.95

Commodore Ready

4120



- Color Composite for 64 Mode Operation
- Color RGB for C128 Mode Operation
- Plus Switchable in Green Monochrome
- Cables Included

**Quantity Limited*

$219.95*

THOMSON

Built-in Tilt Stand

MAGNAVOX

CM8762

- Color + Green Modes
- Built-in Tilt Stand
- 1-Year Warranty

Suggested use C128D

$239.95

PULL OUT

PRINTERS

OKIDATA

Okimate 20	$129.95
Okimate 20 w/cart	$189.95
120	$189.95
180	$219.95
182	$209.95
182+	$225.95
183	$239.95
192+	$339.95
193+	$449.95
292 w/interface	$449.95
293 w/interface	$585.95
294 w/interface	$819.95
393	$955.95
Lazer 6	$CALL
390	$479.95
391	$649.95
320	$345.95
321	$445.95

Toshiba

321SL	$489.95
341 SL	$659.95
P351 Model II	$899.95
351 SX 400 cps	$979.95

Star Micronics

NX-1000	$165.95*
NX-1000C	$169.95
NX-1000 Color	$225.95
NX-1000C Color	$229.95
NX-15	$289.95
NR-10	$319.95
NR-15	$419.95
NB-15 24 Pin	$669.95
NX-2400	$309.95
NB24-10 24 Pin	$399.95
NB24-15 24 Pin	$545.95
Laser 8	$1759.95
ND-15	$349.95
NL-10	$149.95

**w/cable purchase*

BROTHER

M1109	$159.95
M1509	$335.95
M1709	$459.95
Twinwriter 6 Dot & Daisy	$899.95
M1724L	$619.95
HR20	$345.95
HR40	$559.95
HR60	$649.95

EPSON

LX800	$184.95
FX86E	$329.95
FX286E	$424.95
EX800	$399.95
LQ500	$339.95
LQ2500	$789.95
GQ3500	$LOW
LQ850	$525.95
LQ1050	$699.95

SEIKOSHA

SP 180Ai	$125.95*
SP 180VC	$125.95*
SP 1000VC	$139.95
SP 1000AP	$159.95
SP 1200VC	$149.95
SP 1200Ai	$159.95
SP 1200AS RS232	$159.95
SL 80Ai	$289.95
MP5420FA	$999.95
SP Series Ribbon	$7.95
SK3000 Ai	$339.95
SK3005 Ai	$419.95
SPB 10	$CALL
SL 130Ai	$599.95

** Quantities Limited*

Panasonic Office Automation

1080i Model II	$159.95
1091i Model II	$189.95
1092i	$299.95
1592	$375.95
1595	$419.95
3131	$289.95
3151	$459.95
KXP 4450 Laser	$1649.95
1524 24 Pin	$529.95
Fax Partner	$579.95
Optical Scanner	$859.95

CITIZEN

120 D	$149.95
180 D	$169.95
MSP-10	$259.95
MSP-40	$289.95
MSP-15E	$335.95
MSP-50	$399.95
MSP-45	$425.95
MSP-55	$479.95
Premiere 35	$459.95
Tribute 224	$619.95
Tribute 124	$489.95

Join the thousands who shop Lyco and Save

We stock interfacing for Atari, Commodore, Apple and IBM.

User Group Update

Mickey McLean

The following list includes updated entries to our annual "Guide to Commodore User Groups," which last appeared in the May and June 1988 issues.

When writing to a user group for information, please remember to enclose a self-addressed envelope with postage that is appropriate for the country to which you're writing.

Send typed additions, corrections, and deletions for this list to

COMPUTE! Publications
P.O. Box 5406
Greensboro, NC 27403
Attn: Commodore User Groups

User Group Notes

The correct address for the **Victor Valley Commodore Interest Association (VVCIA)** is P.O. Box 385, Victorville, California 92393.

The **RAM-ROM 84 Commodore Users Group** address is now P.O. Box 3880, Venice, Florida 34293-3880.

The **Commodore Users Group** of New Hampshire has a new mailing address. All correspondence should be sent to P.O. Box 129, Concord, New Hampshire 03302-0129.

Previous listings for the **Kids Computer News** have contained the wrong address. To contact this user group, write to St. Hilda's and St. Hugh's School, 619 West 114th Street, New York, New York 10025.

New Listings

CALIFORNIA

South Orange Commodore Klub (SOCK), 24325 Lakeview Ln., El Toro, CA 92630

FLORIDA

Commodore User Group of Pensacola, P.O. Box 36367, Pensacola, FL 32516 (BBS# 904-456-8205)

ILLINOIS

Board Users Syndicate, P.O. Box 1112, South Holland, IL 60473 (BBS# 312-331-4548)

MARYLAND

Gaithersburg Commodore Users Group, P.O. Box 2033, Gaithersburg, MD 20879

MICHIGAN

Traverse Area Commodore Club, 404 Bates St., Fife Lake, MI 49633

NEBRASKA

Lincoln Commodore User's Group, P.O. Box 30655, Lincoln, NE 68503

NEW MEXICO

Deming Commodore User Group (DCUG), 1400 Mallery Dr., Deming, NM 88030

Commodore Users Group of Roswell (CUGOR), 1619 N. Kansas, Roswell, NM 88201

NEW YORK

New York Commodore Interest Group (NYC=ig), 115 Essex St., Box #146, New York, NY 10002

Riverhead Commodore Club, 330 Court St., Riverhead, NY 11901

Oneida Users' Group, Washington Avenue Community Center, Oneida, NY 13421

TENNESSEE

Springfield Commodore Users Group (SCUGS), P.O. Box 62, Springfield, TN 37172-4025

WEST VIRGINIA

Software Engineeringing Exchange (SEE), Star Rt. 83, Box 49, Ellenboro, WV 26346

WISCONSIN

Milwaukee Area Commodore Enthusiasts (M.A.C.E.), P.O. Box 26216, Milwaukee, WI 53226

Outside the U.S.

PHILIPPINES

Society of Commodore Users in Metro Manila (SCUM), c/o Ruperto A. O. Navarro, 946 Murillo St., Quiapo, Manila, Philippines 1001

BIG SAVINGS ON SOFTWARE!

EDUCATIONAL SOFTWARE

Make Learning Come Alive! It's fun and exciting when you use this Commodore Logo Educational Software. Now children and adults can explore math concepts. With list processing, Logo can be integrated into language arts and other curriculum. Color graphics, on-screen text, and enhanced music capabilities encourage active, hands-on problem solving. Take advantage of the **LOW price.** Order today...and put the fun back into learning!

- Logo is a Powerful Computer Language for Learning, Used in Many Elementary Schools Across the Nation.
- Easy to Use for the Novice or Expert.
- Encourages Experimentation.
- Enjoyable and User Friendly.
- Text Can be Put on Screen for Labeling Pictures, Word Games, More.
- Changeable Text Color Capability.
- Comes with Detailed Information Booklet, Language Disk and Utility Disk.
- Works with the Commodore 64, 64C and 128 Computers with a Compatible Disk Drive.

90-Day Limited Factory Warranty.

List: $69.00

Liquidation Price $19

Item H-3908-7342-074 S/H: $4.50 ea.

Credit card customers can order by phone, 24 hours a day, 7 days a week.

Toll-Free: 1-800-328-0609

SEND TO:
COMB **Authorized Liquidator**
1405 Xenium Lane N/Minneapolis, MN 55441-4494

Send ___ **Commodore Electronic Software Package(s)** Item H-3908-7342-074 at $19 each, plus $4.50 each for insured shipping, handling. (Minnesota residents add 6% sales tax. Sorry, no C.O.D. orders.)

☐ My check or money order is enclosed. (No delays in processing orders paid by check.)

PLEASE CHECK ☐ VISA ☐ MasterCard ☐ DISCOVER ☐ AMERICAN EXPRESS

Acct. No. _____ Exp. ___/___

PLEASE PRINT CLEARLY

Name _____

Address _____ Apt. #_____

City_____ State _____

ZIP _____ Phone (___)_____

Sign Here _____

Pattern Fill

Robert Bixby

Hi-res graphics screens become works of art when you use "Pattern Fill," a handy graphics utility that lets you fill areas with any rectangular pattern. Two special effects can be used with the patterns. For the Commodore 64. Joystick required.

Modern paint programs for the 64 include many of the popular tools first used in *MacPaint*, Apple's paint program for the Macintosh. One of the popular Macintosh tools is the Fill tool, which lets you fill any area with an arbitrary pattern.

If your favorite hi-res paint program lacks this tool, try "Pattern Fill." Even if your paint program makes some kind of fill available, you might find that one of Pattern Fill's two special effects is just what you need.

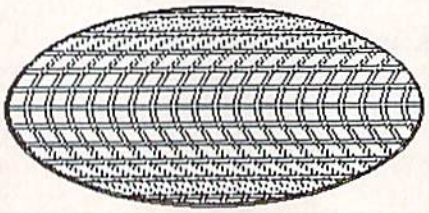
Getting Started

Pattern Fill is written entirely in machine language, so you'll need to type it in with "MLX," the machine language entry program found elsewhere in this issue. When you run MLX, you're prompted for the starting and ending addresses for the data you'll be typing in. Respond with these values:

Starting address: C000
Ending address: C4D7

Type in the data for Pattern Fill. Be sure to save the program before exiting MLX.

When you're ready to use Pattern Fill, load the program into memory with a statement of the form LOAD"PATTERNFILL",8,1 (LOAD"PATTERNFILL",1,1 for tape), substituting for PATTERNFILL the name you used when you saved the program. Next, load your hi-res graphics screen. (Pattern Fill uses high-resolution mode only—color is not supported.) For Pattern Fill to find your picture file, it should be loaded into memory at location 24576. If you're using *DOODLE!* or *Koala Paint*, simply load your picture file directly from BASIC. Start Pattern Fill by typing SYS 49152.



"Pattern Fill" lets you easily enhance your hi-res artwork. This oval was filled using the L key option.

A small green arrow will appear at the upper left corner of the screen. To select the area that you wish to use as a fill pattern, use a joystick plugged into port 2. Move the arrow to the upper left corner of the area and press the fire button. Then move to the lower right corner of the area and press the fire button again. You have defined the fill pattern. Note that the pattern can be any size, from 1 pixel × 1 pixel to the size of the whole screen.

Before you begin to fill an area, be sure that it's completely enclosed. If there are any leaks, Pattern Fill will probably find them. The edges of the screen *do not* count as borders. When you're sure that the area you wish to fill has a secure border, move the cursor to the upper left corner of the area and press the fire button.

Intelligence Not Included

Pattern Fill is written to be compact and quick. As a result, it's not particularly bright. If you are filling a shape much more complex than an oval or a rectangle, Pattern Fill will probably miss filling in some of it. If this happens, wait for the arrow to stop moving and then reposition it at the upper corner of the unfilled area. Repeat this procedure until your whole shape is filled. You'll find that Pattern Fill does an excellent job—there won't be a seam between any of the fills.

You may pick up a new pattern at any time. Press RETURN, and the old pattern will be wiped out. Use the joystick to define a new pattern.

Special Effects

Pattern Fill has three special effects that can help you enhance your fills. First, you can hold down the CTRL key while you fill for a "negative" fill: All the *on* pixels from the original pattern will be considered *off*, and all the *off* pixels will be considered *on*.

Second, Pattern Fill can follow the left or right edge of the filled area as it fills. To follow the left side, hold down the L key as you fill. Likewise, hold down the R key to follow the right edge.

Back to BASIC

When you've finished using Pattern Fill, exit the program by pressing RUN/STOP. Since Pattern Fill exits with a machine language RTS (ReTurn from Subroutine), you can call it from your own programs with a SYS 49152 (from BASIC) or a JSR 49152 (from ML).

See program listing on page 70.

• Summer brings vacation days and the Summer CES. Amidst our travels, we suffered a slight communication breakdown. The August *GAZETTE Disk* contains a program, "SpeedPrint," which was originally slated for the August issue but did not appear in the magazine. The article *will* appear in the October or November issue, and it will be included on the corresponding monthly disk. Our apologies for any confusion this may have caused.

• The article for "Ramdisk 128" (April 1988) confusingly states that to save a machine language file to the ramdisk, you must include the filename, starting address, ending address, plus one of the saves. The article should read: For machine language files, specify the filename, starting address, and the ending address plus 1.

• The listing for "Square Logix" (June 1988) has some incorrect characters in lines 10, 29, and 64. The correct lines follow:

```
RS 10 WINDOW0,0,39,24,1:PRINTT
      AB(9)"{RVS}{BLU}
      {4 SPACES}SQUARE LOGIX
      {5 SPACES}{DOWN}"
DX 29 DO:M1=M1+1:J=INT(RND(1)*
      ZZ):K=INT(RND(1)*ZZ):GOS
      UB33:SOUND2,8000,1:ONG1G
      OSUB30,30,31,31:LOOPUNTI
      LM1=LV*3:J=2:K=2:WZ=1:GO
      SUB35:TI$="000000":GOTO5
      0
GE 64 R1=R1+1:U1=-1:L1=-1:D1=-
      1:IFR1>0THENJ=J+1+(J=5)
```

• There are a few problems with "Super Printer Driver" from "The *GEOS* Column" in the July 1988 issue. First, the programs listed in the magazine are mislabeled: Program 1 is "Customizer," and Program 2 is "Driver." We apologize for any confusion this may have caused. Second, *GAZETTE Disk* users have had trouble running Customizer from the disk menu. The solution to this problem is to load the customizer program from direct mode with the command LOAD"PR CUSTOMIZER",8. Finally, some of our readers have had trouble using Super Printer Driver. Below are step-by-step instructions that should be of help.

1. Copy PR CUSTOMIZER and PR.OBJ to a new disk.

2. Load and run PR CUSTOMIZER.

3. When the menu appears, select the appropriate printer. The customizer will save the printer driver to your disk.

4. Boot *GEOS*.

5. Insert the new disk, the one containing PR CUSTOMIZER, PR.OBJ, and your printer driver, and open it. (See your *GEOS* manual for details.) If the new disk is not a *GEOS* disk, *GEOS* will ask if you want it converted. Go ahead and convert the disk at this time.

6. Copy the printer driver to your boot disk. (Again, see your *GEOS* manual for details.)

7. Use the Select Printer desk accessory to select the new printer driver as the current printer.

Looking for a GAZETTE back issue?

See page 30.

90 DAY WARRANTY
on Refurbished
GENUINE COMMODORE 64™
Power Supply
Power Supply $19.95
*Return old 64 supply $3.00
Your Cost $16.95
S & H $ 3.50
*Returned 64 supplies must be genuine Commodore™ Brand.

Sick Disk Drive?
Use Physical Exam to adjust alignment, speed & stop position.
1541 Physical Exam Sample screen

Illustrated manual supplies complete instructions to guide you in making necessary adjustments that are indicated by the test diskette. No special scopes or tools needed. Used by many repair shops and individuals to maintain disk drives. Easy to use.

Available for these Commodore Disk Drives 1541, 1571, 8050, 8250, 4040, SFD 1001. $39.95 each

Cardinal Software
14840 Build America Dr.
Woodbridge, VA 22191
Info: (703) 491-6494

800-762-5645

Commodore is a trademark of Commodore Electronics LTD.

Multicolor Graphics Dump

Hubert Cross

With this excellent printer dump for the Commodore 64, your multicolor graphics masterpieces can be faithfully reproduced in black-and-white on an MPS-801, MPS-803, Commodore 1525, or compatible printer.

With a good paint program, you can draw beautiful pictures on your Commodore 64. Seascapes, teddy bears, fish, and moonscapes take on a new quality when drawn with a computer. However, computer art has a unique problem—it's hard to carry around. Most people bring the audience to the computer instead of bringing the computer to the audience.

It's no surprise, then, that printer dump programs are popular. With a graphics dump utility, you can take your favorite drawing and send it to your printer. The drawback to most printer dumps for the 64 is that they work best in standard hi-res mode, while most drawing programs use multicolor mode. Multicolored images are not rendered properly by such a program. (Multicolor pictures printed by hi-res dumps are characterized by vertical stripes.)

"Multicolor Graphics Dump" takes a different approach to displaying multicolor pictures. With Multicolor Graphics Dump (MCGD), each color is assigned a unique pattern (see Figure 1). This makes for an accurate depiction of your multicolor art.

MCGD works with the odd-numbered Commodore printers and compatibles (the MPS-801, MPS-803, and Commodore 1525).

Getting Started

MCGD is written entirely in machine language. Type in the program with "MLX," the machine language entry program found elsewhere in this issue. When asked for starting and ending addresses, respond with these values:

Starting address: C3E8
Ending address: C757

When you've finished entering the data for Multicolor Graphics Dump, be sure to save a copy of the program to disk or tape with the name MCGD.

When you're ready to use MCGD, type LOAD"MCGD",8,1 (for disk) or LOAD"MCGD",1,1 (for tape). Now load your multicolor graphics screen into memory.

When you're ready to make a screen dump, type SYS 50152 to activate MCGD. The program will ask for two numbers: the bitmap number and the color number. Use the following formulas to find the correct numbers for your pictures:

Bitmap number = INT(address of bitmap/8192)
Color number = INT(address of color memory/1024)

After you've entered the proper numbers, the dump begins.

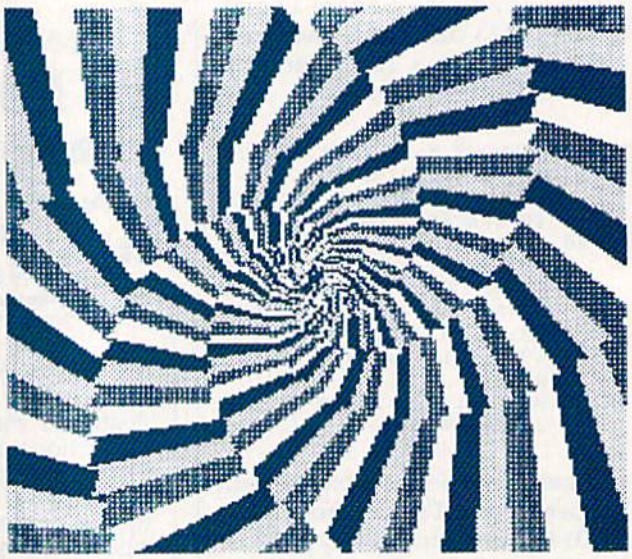
The background is always white. This should make your ribbon last longer. Remember this when you design your screens. Also, keep in mind that color combinations that are objectionable on the screen may look fine on paper.

I've included a multicolor screen dump as an example of what this program can produce. It is found in Figure 2.

See program listing on page 78.

Figure 1

Figure 2



Multicolor Graphics and Video Storage

Dale McBane, Assistant Technical Editor

The VIC-II is the chip responsible for video output on the Commodore 64. The 64's microprocessor, the 6510, simply tells the VIC-II where to find the data to display and how to display it.

The VIC-II supports two graphics display modes on the 64: high resolution (hi res) and multicolor. Hi-res screens, as the name implies, boast higher resolution, but they're limited by the number of colors that can be displayed. Multicolor screens have a lower resolution, but more colors are available for each pixel.

Multicolor screens consist of 160 pixels horizontally by 200 pixels vertically—a total of 32,000 pixels. Multicolor pixels may be rendered in one of three foreground colors or in the background color. To make the extra colors available in multicolor screens, each pixel requires two bits of memory for storage. Storing a multicolor bitmap, then, requires 8000 bytes: 32,000 (pixels) times 2 (bits per pixel)—or 64,000 (bits)—divided by 8 (bits per byte).

The two bits representing each multicolor pixel can have one of four values: 00, 01, 10, or 11. Pixels with bit values of 00 take their color information from the screen background color register at location 53281 ($D021). Pixels with bit values of 11 take their color information from color memory at locations 55296–56295 ($D800–$DBE7).

The VIC-II has a unique way of storing the color information for pixels with bit values of 01 and 10. To determine their colors, the VIC-II divides the bitmap into 1000 eight-by-eight groups of pixels. Each of these groups gets its color information from one byte of screen memory. Pixels with bit values of 01 take their color information from the upper four bits of screen memory, and pixels with bit values of 10 take theirs from the lower four bits. Including screen memory and color memory, it takes 2000 bytes to store the color information for a multicolor screen. You need a total of 10,000 bytes to store a multicolor graphics screen: 8000 for the bitmap, 1000 for screen memory, and 1000 for color memory.

Bank Selection

Unlike the 6510, which can address 64K of memory, the VIC-II can address only 16K of memory at once. To overcome this limitation, the VIC-II divides the 64's memory into four 16K banks. The complex interface adapter #2 (CIA #2) has a register to tell the VIC-II which bank to get its information from.

Bank 0, located at 0–16383 ($0000–$3FFF), is the default video bank. Bank 0 isn't used for bitmapped graphics very often because much of the memory in this bank is used by the system. The BASIC and Kernal ROMs use the first 1024 bytes of bank 0 extensively, and the default position for screen memory is in this bank at 1024–2023 ($0400–$07E7). The BASIC text area also normally starts at 2048 ($0800), right after screen memory.

Another drawback to using bank 0 for bitmapped graphics is the character-generator-ROM image located at 4096–8191 ($1000–$1FFF). The 6510 addresses the character-generator ROM at 53248–57343 ($D000–$DFFF), but, because of an addressing trick, the VIC-II sees a copy at 4096 ($1000). If you're writing a BASIC program to manipulate the bitmapped screen, you can use this bank by moving the start of BASIC text to 16384 ($4000). The problem with this solution is that the pointer to the start of BASIC text must be changed each time the program is to be used.

Bank 1, located at 16384–32767 ($4000–$7FFF), is the only video bank comprised totally of free RAM. The only drawback to using bank 1 from machine language is that the VIC-II can't see character-generator ROM here. Since the character-generator ROM can easily be copied to RAM, this isn't really a problem. Using bank 1 from BASIC limits the amount of RAM left for your program text and variables. Most commercial hi-res graphics programs, including *DOODLE!* and *Koala Paint*, use bank 1 to store their bitmapped screens.

Bank 2, located at 32768–49151 ($8000–$BFFF), has 8K of its address space—from 40960 to 49151 ($A000–$BFFF)—occupied by BASIC ROM. The VIC-II always sees the RAM underneath the BASIC ROM, but if the ROM isn't switched out, the 6510 will see the ROM. This means that your program will be able to write to the screen but won't be able to read from it. It will read the BASIC ROM instead of the RAM underneath. The VIC-II also sees a copy of the character-generator ROM in bank 2, at 36864–40959 ($9000–$9FFF). That leaves only a 4K block of memory at 32768 ($8000) totally free for graphics. If you're writing a machine language program that needs both text and graphics and doesn't need any routines from BASIC ROM, bank 2 may be a good choice.

Bank 3, located at 49152–65535 ($C000–$FFFF), has 4K of free RAM, 4K of Input/Output (I/O) registers, and 8K of Kernal ROM. Programming graphics within bank 3 can be difficult at best. Even though the 6510 addresses character ROM within this bank, the VIC-II can't see it here. The character-generator ROM could be copied to RAM, but free RAM is already limited in this bank. The VIC-II can see the RAM underneath the Kernal ROM, but using that RAM for graphics would be messy even from machine language. In general, bank 3 isn't a good choice for bitmapped graphics.

Inner Limits

Remember that the VIC-II can address only 16K of memory at one time. This means that in this 16K address space there are sixteen 1K areas where text screens can be stored and two 8K blocks where bitmapped screens can be located. A bitmap must be located on an even 8K boundary, and screen memory must be located on an even 1K boundary.

There are only eight even 8K boundaries within the 64's address space—therefore, only eight locations where a bitmap can begin: 0 ($0000), 8192 ($2000), 16384 ($4000), 24576 ($6000), 32768 ($8000), 40960 ($A000), 49152

Precision Data Products™
P.O. Box 8367, Grand Rapids, MI 49518

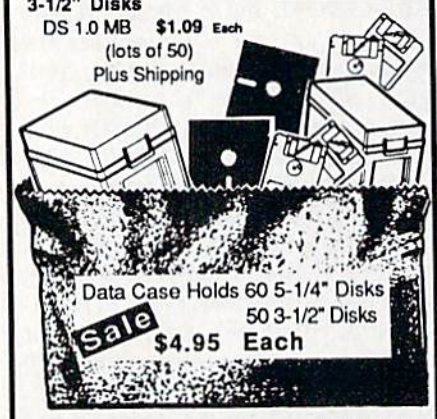
616-452-3457 Fax: 616-452-4914

~~SHOPPING~~ BUYING LIST

5-1/4" Disks (lots of 100)
DSDD .29¢ Each
DSHD .89¢ Each

Lifetime warranty
ERROR FREE
With Envelopes,
WP/TABS,
Sturdy PVC Jacket

3-1/2" Disks
DS 1.0 MB $1.09 Each
(lots of 50)
Plus Shipping



Foreign Inquiries Invited
Call for FREE catalog
C.O.D.
Complete line of quality supplies for your computer
Minimum order $25.00. Prices subject to change

For Fastest Service
Call Toll Free:
800-258-0028
IN MI: 800-632-2468

MAIL TO:
COMPUTE!'S GAZETTE
SUBSCRIBER SERVICE
P.O. Box 10958, Des Moines, IA 50340-0958

Change of Address: Please advise as early as possible. Attach label with your old address and write in new address below.

New Subscriber: Fill in your name and address below. Use separate sheet for gift orders.

PLACE LABEL HERE

Renewal: Attach label.
.....One year $24.00 ..... Two years $45.00
(Foreign subscribers please add $6.00 per year for postage)

NAME .....

STREET .....

CITY STATE ZIP .....

..... Please bill me..... Payment enclosed

For other subscription questions or problems, please write a note and send entire form to the above address, OR CALL TOLL-FREE:

1-(800) 727-6937

($C000), and 57344 ($E000). Of these, 16384 ($4000) and 24576 ($6000)—both of which are in video bank 1—are the most commonly used. *Koala Paint* and *DOODLE!* both store their bitmaps at 24576.

There are 64 locations within the 64's memory where screen memory can begin. (The default location is 1024.) When screen memory is being used as color memory for bitmapped screens, it usually is placed immediately adjacent to the bitmap to make loading and saving the screens easier. If, for example, the bitmap is located at 24576 ($6000), the screen memory will most likely be located at 23552 ($5C00) or 32768 ($8000). *DOODLE!* stores its screen memory at 23552.

Multicolor graphics screens can be the exception to this rule. Multicolor graphics screens have part of their color information stored in color memory and part in screen memory. Because the color memory is separated from the bitmap and screen memory, the screen can't be saved as a block using the Kernal SAVE routine. This means that screen memory used as color memory for multicolor bitmaps may be located in any of the eight 1K blocks not used by the bitmap itself. For example, if the bitmap is located at 24576 ($6000), screen memory might be located at any of the following locations: 16384 ($4000), 17408 ($4400), 18432 ($4800), 19456 ($4C00), 20480 ($5000), 21504 ($5400), 22528 ($5800), or 23552 ($5C00).

Finding the screen memory in a multicolor graphics file stored on disk can be difficult. Most programs either write screens to disk in sections or move the data into one continuous block before saving. Both techniques are used in order to save disk space. If you load one of these files back into memory with BASIC's LOAD command, the data for the bitmap will most likely be in the correct position, but the data for screen and color memory will be out of position. The only way to correct this problem is to move the data into position yourself.

For example, one of the most popular file formats for storing multicolor graphics screens is the one used by *Koala Paint*. If you were to load a *Koala Paint* file into memory, you would find the bitmap, screen memory, and color memory arranged as follows:

Bitmap:
24576–32575 ($6000–$7F3F)

Screen memory (color information):
32576–33575 ($7F40–$8327)

Color memory:
33576–34575 ($8328–$870F)

In order to display the screen, you would have to move color memory to 55296 ($D800) and screen memory to 23552 ($5C00). The following short program does just that. It loads a *Koala Paint* graphics file and displays it until you press a key. To load a different file, change the filename in the variable NM$ in line 10.

```
SR 10 NM$="{1}PIC G MONKEY
      {2 SPACES}"
FM 20 IFF=0THENF=1:LOADNM$,8,1
CC 30 BANK=1:SCNOFFSET=1:COLOF
      FSET=7
SB 40 POKE56576,(PEEK(56576)AN
      D252)OR(3-BANK):REM SET
      {SPACE}BANK
AM 50 POKE53265,PEEK(53265)OR3
      2:REM TURN ON BITMAP
DA 60 POKE53272,(COLOFFSET*16+
      SCNOFFSET*8):REM POSITIO
      N HI-RES AND COLOR MEMOR
      IES
QK 70 POKE53270,PEEK(53270)OR1
      6:REM SET MULTICOLOR MOD
      E
JE 80 FOR I=23552TO24551:POKEI
      ,PEEK(I+9024):NEXTI:REM
      {SPACE}32576-33575
QA 90 FOR I=55296TO56295:POKEI
      ,PEEK(I-21720):NEXTI:REM
       33576-34575
HA 100 A=PEEK(34576):POKE53280
      ,A:POKE53281,A
DA 110 GETK$:IFK$="" THEN110
BB 120 POKE56576,199:POKE53265
      ,27:POKE53270,200:POKE5
      3272,21
KM 130 POKE53280,14:POKE53281,
      6
```

To print a *Koala Paint* file with MCGD, follow this procedure:

- Load MCGD and type NEW.
- Load the display program above.
- Change the filename in line 10 to the name of the file you want to print, and run the program.
- Once the file is displayed, press any key to exit the program.
- Type SYS 50152 to start MCGD.
- Enter 3 for the bitmap number and 23 for the screen memory number.

When you finish, you should have a fairly good representation of your screen.

ML Boot

David Roth

Automate your boot-up time with "ML Boot." It gets every computing session off to a good start by allowing you to load as many as nine utilities at once. For the 64. A disk drive is required.

If you use the same group of programs on a regular basis, you need an autoboot program. Rather than loading programs individually, you just load the autobooter and let it do the work.

Unfortunately, most autoboot programs install no more than two or three routines. And writing one from scratch can leave you wondering whether it's really worth the effort.

But with "ML Boot," you can easily boot as many as nine machine language programs that you've specified in a data file. To create a new data file, you simply run an accompanying BASIC program that requests the name and starting address of each machine language program. Then, with one load command, the system automatically installs each routine in the *boot* data file. Screen and text colors are also set, and control is returned to you. The routines in the boot file—be they programming utilities, BASIC extensions, or even a word processor—now reside in memory, ready to go.

Getting Started

The autoboot system is comprised of three programs. Programs 1 and 2 perform the actual system boot and are written entirely in machine language. Enter them with "MLX," the machine language entry program found elsewhere in this issue.

When you run MLX, specify the starting and ending addresses indicated below for each program.

Program 1
Starting address: 02A7
Ending address: 0306

Program 2
Starting address: 0801
Ending address: 0A60

Follow the instructions for MLX carefully. Before exiting, be sure to save a copy of each program to the disk containing the files you intend to boot. Use the filename BOOT .EXE for Program 1 and the name GENBOOT.EXE for Program 2.

Program 3 is a BASIC program that creates a boot data file named BOOT.DAT. Type it in and save a copy on the disk containing Programs 1 and 2.

Using the System

To construct the boot data file, load and run Program 3. Now, choose the background, border, and text colors that you want to have appear each time you boot. Enter the values for these at the appropriate prompts. (If necessary, consult the color table in your reference guide.) Press RETURN at each prompt to select the ML Boot default, blue text on a black background.

Next, enter the names and starting addresses for each file that you want booted. The starting address can be in either decimal or hexadecimal. To indicate a hexadecimal address, precede the number with $. If there isn't an initialization or startup address for the routine (that is, if you don't need to SYS to an address to install the program), simply enter 0 or $0000 as the starting address. This will cause the boot routine to load, but not initialize, the corresponding program.

Programs listed in the boot file must use distinct areas of memory—their starting and ending addresses cannot overlap. For instance, for program development, you might use a ramdisk (say at $C000), the DOS wedge (at $CC00), "MetaBASIC" (at $9000), and the LADS assembler (no initialization address). Also, note that ML Boot will not work for BASIC routines that would overwrite it as they load, or any other routines that load from 679 ($02A7) to 2815 ($0AFF).

When you've finished entering filenames, the program lets you check your entries. Shown are the three color values, the number of programs to boot, and each program's filename and load address in low-byte/high-byte form. If you haven't made any errors, press RETURN to write the data file to disk.

The system is now ready to boot. Type LOAD "BOOT.EXE",8,1 and then press RETURN. The computer will load "GENBOOT.EXE", which in turn installs each program specified in "BOOT.DAT".

Hint: You can save a bit of typing by making "BOOT.EXE" the first program on your disk. Henceforth, you can autoboot with LOAD ":*",8,1.

See program listings on page 73.

SpeedCheck 128

A Spelling Checker for *SpeedScript 128*

Larry D. Smith

Here's a versatile and easy-to-use spelling checker for SpeedScript 128, *our popular 80-column word processor for the Commodore 128. It builds a personalized dictionary of the words you use most frequently—and it works with any* SpeedScript *file. It's designed to work in either 40- or 80-column mode. A copy of* SpeedScript 128 *(October 1987) and a disk drive are required.*

Since the debut of *SpeedScript* in January 1984, *COMPUTE!'s Gazette* has published a number of utilities that support this word processor. "SpeedCheck," published in the December 1985 issue, is a spelling checker designed for use with the 64 version of *SpeedScript*. Because of the 64's memory limitations and the 1541's sluggishness, SpeedCheck tends to be slow. With the introduction of the 128 and the 1571, we can take advantage of the speedier processing time. "SpeedCheck 128" is designed for use with *SpeedScript 128* text files, and it works on files created from any version of *SpeedScript*. It also works in 40- or 80-column mode. The new program is more than ten times faster than its 64 counterpart.

SpeedCheck 128 examines your documents word by word, comparing your typing with entries in its dictionary. If the program comes across a word it doesn't recognize, it highlights the word on your screen so that you can correct any misspellings immediately. SpeedCheck also highlights correctly spelled words if they aren't already in its dictionary. These new words can then be added to the dictionary with the touch of a single key.

Commercial spelling checkers come with prepared dictionary disks containing several thousand words. SpeedCheck 128 can't match that—at least not at first. You start with an empty dictionary and add words as you go along. This means that using SpeedCheck 128 may be a bit tedious at first. However, you'll soon build a customized dictionary disk that contains the words you use most often.

Save Your Dictionaries

Let's clear up some common misconceptions about spelling checker programs before you discard your dictionaries and grammar books. Like most such programs, SpeedCheck can be deceived. If you type *form* when you mean *from*, SpeedCheck cannot detect the mistake (assuming both words are in your dictionary). SpeedCheck makes no judgment about context; as far as it's concerned, *form* is a correctly spelled word.

A price had to be paid to keep SpeedCheck short (only 2K) and fast. For one thing, SpeedCheck checks the spelling of only those words which have five or more characters, but this can easily be changed to any value you desire (more on this later).

Five characters is an arbitrary limit, but it yields a good speed/performance ratio. You could drop the limit to as few as two characters and check nearly every word in the document, but then it would take much longer to check a large file. Unless you're a world-class misspeller, you'll nearly always spell words like *a*, *an*, and *the* correctly. For most people, it's words like *knowledgeable* that cause problems.

When counting characters in words, SpeedCheck 128 recognizes only the letters *a–z*. The apostrophe and hyphen are not recognized, so a word such as *left-handed* or a contraction such as *aren't* is counted as two words (*left* and *handed*) or as a misspelled word (*aren*). A letter's case (upper- or lowercase) isn't significant; all letters are converted to lowercase when looked up or added to the dictionary. Thus, a single dictionary entry would match *basic*, *BASIC*, and *Basic*.

Words in the SpeedCheck 128 dictionary disk are kept in sequential files, with one file for each of the 26 possible initial letters. If the dictionary files don't exist on the dictionary disk, SpeedCheck 128 creates them automatically. (If the disk-drive error light flashes during checking, don't worry; SpeedCheck 128 will correct the problem.) As a new word is added, it is tacked onto the end of the appropriate file. This

makes adding words to the dictionary fast and simple, but it makes looking up words slower because the words are in random—rather than alphabetical—order. Within the file for *z*, for example, *zebra* might be found between *zymurgy* and *zipper*. The only way to find a particular item in randomly ordered data is to search sequentially from the first item until the desired item is found. Thus, when SpeedCheck looks up a word, it must hunt through all the words with the same initial letter before it can determine that the word is not present.

To help minimize the time needed to search sequentially through the dictionary, SpeedCheck 128 loads each of the 26 files that make up your dictionary into bank 0 of the 128's RAM, one at a time. This allows SpeedCheck 128 to check the entire text file while having to load the dictionary files only once.

With the text file and the dictionary file in memory, SpeedCheck 128 is quite fast. To further enhance its performance, SpeedCheck 128 switches into Fast mode when input from the user isn't needed. Using Fast mode effectively doubles the speed of the 128 and halves the time needed to check documents.

Typing It In

SpeedCheck 128 is written in machine language, so you'll need to enter it with the 128 version of "MLX," the machine language entry program found frequently in this magazine (last month's issue contains the program, as does this month's disk). When you load and run MLX, you'll be prompted for the starting and ending addresses of SpeedCheck 128. Respond with the values indicated below.

Starting address: 1C01
Ending address: 2408

Be sure to save a copy of SpeedCheck 128 before exiting from MLX.

Before you begin to use SpeedCheck 128, you need to prepare a dictionary disk. SpeedCheck 128 can use any blank disk as a dictionary disk since it builds the dictionary automatically as it goes. To format a disk for use as a dictionary disk, type the following commands:

```
OPEN1,8,15,"N0:DICTIONARY,ID"
:CLOSE1
```

where *ID* is any two characters. (Note that it is a good idea to be sure that the ID of each of your disks is unique.) SpeedCheck 128 builds the dictionary automatically as it works.

Even though SpeedCheck 128 is written in machine language, it can be loaded, run, and saved as if it were a BASIC program. To begin, simply load SpeedCheck 128 and type RUN. You'll see a copyright message and a prompt for a filename. Place the disk containing the text file you wish to check into the disk drive and type the name of the file. SpeedCheck 128 will search the disk for the file and warn you if it is not found. If you forget the name of the file, press RUN/STOP–RESTORE to exit from SpeedCheck 128, type DIRECTORY to list the files on the disk, and type RUN to reenter the spelling checker. Once SpeedCheck 128 has successfully loaded the file to be checked, it prompts you to place the dictionary disk in the drive. After you've done so, press any key to continue.

Add, Edit, or Skip

Once you've pressed a key, SpeedCheck 128 begins checking your document. If you're using a 40-column monitor, the screen goes blank. Don't worry; this is a side effect of Fast mode. The screen returns to normal if SpeedCheck 128 needs input from the user or when it has finished checking the document.

If SpeedCheck 128 finds a word that isn't in its dictionary, it displays the word in reverse field at the top of the screen, along with a few words that follow the text (for context). SpeedCheck 128 then displays the menu of options available to you. You may either add the word to the dictionary, edit the word, or skip over the word.

Pressing the A key lets you add the word to the dictionary. Be sure the word is spelled correctly before you make the addition. When you first use SpeedCheck 128, it stops at nearly every word. As the dictionary grows, SpeedCheck 128 won't stop as often.

Pressing the E key lets you edit the misspelled word. SpeedCheck 128 prompts you for the new spelling of the word and then checks the new spelling against its dictionary. If the word is still not found in the dictionary, it is displayed at the top of the screen again. Add, edit, or skip it as before.

Press the S key to ignore the misspelled word and continue checking the document. The Skip option is handy when the program encounters a name or address or some other correctly spelled word that you don't want in your dictionary.

Once the document has been checked, the dictionary disk is validated. (*Do not* store your dictionary on a *GEOS* disk; the normal Validate command will ruin a *GEOS* disk.) Also, if any of the words in the text file have been edited, SpeedCheck 128 asks if you want to resave the text file. If you answer *yes*, SpeedCheck 128 prompts you for a filename. If you wish to replace the existing file, simply use the Save with Replace command (@0:) in front of the name of the file. Don't worry about the Save with Replace bug; SpeedCheck 128 gets around the bug by scratching the file and saving it normally.

Customizing SpeedCheck

It's easy to change the value that represents the minimum number of characters for words you plan to add or look up. Just load SpeedCheck 128 and POKE the desired value into location 9167. PRINT PEEK(9167) will show that the current value is 5. To change the program so that it checks words with four letters or more, type POKE 9167,4. If you save a copy of SpeedCheck 128 after you've changed the value in 9167, your new value will be incorporated into SpeedCheck 128. Don't decrease the limit to less than two characters.

You can use one minimum-length value for a while and then change to another without having to create a new dictionary disk. But consider that if you use a four-character limit extensively and then switch to a five-character limit, you'll have many four-character words in the dictionary that the new version will never use. Likewise, if you use a five-character limit extensively, then switch to a four-character limit, searching will be slowed because all four-character words will be found near the end of the dictionary.

See program listing on page 69.

Disk Package

Barry Camp

You may never need the DOS Wedge again if you use this power-packed utility. It offers the standard Wedge commands and then some—and it includes a complete disk editor. The 1764 RAM Expansion Module is also supported. For the 64 with a 1541, 1571, or 1581 disk drive.

The DOS Wedge (called "DOS 5.1" on the test/demo disk which accompanies the 1541 and 1571 drives) has long been a mainstay for 64 users who want quick, easy, and painless communication with their 1541 disk drives. However, the Wedge does have limitations. If you want to lock or unlock files, change the name on a disk's header, find out the starting and ending addresses of a program, or rescue an unclosed (splat) file, the DOS Wedge is of little help.

"Disk Package" is a replacement for the DOS Wedge that can do all these things and more. Aptly named, it's a complete DOS support package. It even features a built-in disk sector editor that allows you to alter individual bytes on a disk. Many other features are available, including a command that lets you change a disk drive's internal device (or unit) number, verify your programs, and retrieve the starting and ending addresses of any BASIC or machine language program. Disk Package also works with Commodore's 1764 RAM Expansion Module (in its RAMDOS configuration) and the 1571 and 1581 disk drives.

Getting Started

Disk Package (Program 1) is written entirely in machine language. Type it in using "MLX," the machine language entry program found elsewhere in this issue. When MLX prompts you for the starting and ending addresses, respond with the following values:

Starting Address: 0801
Ending Address: 1218

After you've finished entering the program, save a copy to disk before exiting MLX. Since it's possible to erase a disk while using Disk Package, you should save a backup copy or two to other disks from within MLX.

If you plan to use a 1764 RAM Expander with Disk Package, type in Program 2, "1764 Interface." Like Program 1, this program is written in machine language and also requires MLX for entry. Here are the starting and ending addresses for Program 2:

Starting Address: 0801
Ending Address: 0B60

Again, when you've finished entering the data, be sure to save at least one extra copy of the program to a backup disk.

The DOS Wedge Revisited

Program 1, Disk Package, loads and runs like a normal BASIC program. When you run it, it installs itself at locations 49152–51614 ($C000–$C99E) and is ready for use.

The Quick Reference Table lists all Disk Package commands. The table includes two sections: the first part on DOS commands; the second, commands for a disk editing system. In general, the commands common to Disk Package and the DOS Wedge work the same, but some of these are enhanced in Disk Package.

• Before the drive status is displayed, Disk Package clears the screen line, making it easier to read

the status on a cluttered screen. As an added convenience, the current device number is also shown.

- When a directory is being displayed, the @ symbol is an optional character—all you need to do is type $ and press RETURN.
- When you're switching between drives, the @# command accepts only the numbers 4 through 30; any other number causes an ILLEGAL DEVICE NUMBER message to be displayed.
- When you're performing a load or save with Disk Package, it blanks the screen and sends a DOS UI− command to the drive. On a 1541, this can speed up loads and saves by 15 percent. Upon completion, the program restores the screen and sends a UI+ to the drive, resuming its normal operation.
- Disk Package no longer supports the little-used "[volume]" identifier (available in the DOS Wedge).

New Commands

Nine new wedge commands are available in Disk Package. One gives you a quick and easy inventory of available free memory. Type @F and press RETURN to get a true count of the number of bytes available.

To display the starting and ending addresses of a program without disturbing the program currently in memory, type a semicolon followed by a program filename. Both decimal and hexadecimal address values are shown. For example, if you enter

```
;SPEEDSCRIPT 3.2
```

with the file SPEEDSCRIPT 3.2 on the disk in your drive, you'll see

```
START: 2049 (0801) END: 8200 (2008)
```

The @U0>*dv* command works like a device number switch, changing the internal unit number of your disk drive. Observant owners of the newer drives (like the 1581) will notice in the user's guide that the *dv* argument of this command must be a single character code (for example, CHR$(*dv*)). Instead of using this method, Disk Package accepts ASCII digits to allow this command to work on any drive (even a 1541). For example, to switch a drive's unit number to 24, enter @U0>24.

Whenever this command is executed, Disk Package automatically follows with the @# command, thereby maintaining communication with that drive. If the number requested falls outside the range of legal numbers (4–30) or was otherwise entered incorrectly, then whatever information you enter is sent directly to the drive, allowing other U0 and U0> commands to function properly.

Another new command allows you to verify your programs, in the rare event that it's necessary (for instance, when you're using a suspected faulty disk or a misaligned drive, or if a power surge occurs during a save). Just type an equal sign followed by the name of the program to be verified and then press RETURN.

Note that the Load, Save, Verify, and Display Starting/Ending Address commands are designed to operate with or without quotation marks around the filename. As with the DOS Wedge, you can display a directory and then load a program using its directory entry by typing %, /, or ↑ over the first digit in the directory listing and then pressing RETURN. The other commands just mentioned also operate in a similar fashion.

If you own a 1581, you can move into a previously created partition in one of three ways. Either use @/*partition name* from immediate mode, @"/*partition name*" from immediate or program mode, or type @/ at the beginning of a directory entry, like this:

Quick Reference Table: Disk Package Commands

Symbols and abbreviations for DOS Commands and Disk Editing System Commands
+ denotes a DOS Wedge command.
* indicates wildcards are not supported with the 1764.
X indicates command not available with the 1764.
means an @#*dv* is automatically executed following this command.
Parameters or characters enclosed in brackets ([ ]) are optional.
dr: drive number (0,1)
fn: filename
dv: device number
tr: track number
sc: sector number
sx: starting sector number
ex: ending sector number

DOS Commands			Description
@		+	Display current device number and status
[@]$[[*dr:*]*fn*[?][*][=*type*]]		*+	Display directory (@ is optional)
@*command*		+	Send standard DOS command
@#*dv*		+	Communicate with device *dv* (4–30)
@U0>*dv*		#	Change drive's device number to *dv* (4–30)
@E		X	Enter Disk Editing System
@F			Display number of bytes free
@Q		+	Quit (deactivates Disk Package)
@!			Reset computer (cold start)
@WP+	(1541 only)	X	Disk soft write-protect on
@WP−	(1541 only)	X	Disk soft write-protect off
@/[*dr:*]*fn*	(1581 only)	X	Select partition (cannot be used to create partitions; use OPEN instead)
%[*dr:*]*fn*[?][*]		*+	Nonrelocatable LOAD (ML)
/[*dr:*]*fn*[?][*]		*+	Relocatable LOAD (BASIC)
↑[*dr:*]*fn*[?][*]		*+	Relocatable LOAD/auto-RUN (BASIC)
←[*dr:*]*fn*		+	SAVE (BASIC)
=[*dr:*]*fn*[?][*]		*	VERIFY (ML and BASIC)
;[*dr:*]*fn*			Display starting and ending addresses

Disk Editing System Commands
(All arguments must be in hexadecimal)

R[*tr,sc*]	X	Read track and sector
W*tr,sc*	X	Write track and sector
N	X	Read next sector of file
L[*sx*[,*ex*]]	X	Display sector to screen
?	X	Display numbers of last track and sector read
P*dv*[,*sx*[,*ex*]]	X	List sector to device (3–7)
P*dv*?	X	List last track and sector numbers to device (3–7)
Z[*sx*[,*ex*]]	X	Clear all or part of sector
X	X	Exit Disk Editing System (to BASIC)

Partition entry before:
400 "VIDEO GAMES" CBM

Type @/ and press RETURN:
@/0 "VIDEO GAMES" CBM

Disk status after:
#9: 02, SELECTED PARTITION,01,10

Disk Package ignores the second 0 character in 400 in the sample partition entry. Notice that 0: in front of the partition name is unnecessary. Also, do not attempt to create a partition using @/—use the OPEN and PRINT# statements as stated in the 1581 user's guide instead.

Write Protection

With the @WP+ and @WP− commands, you can switch soft write-protection on or off without ever covering the write-protect notch. With this feature, any attempt to save a program, open a file for writing, scratch a file, or otherwise write to the disk is aborted, and the DOS error 73,CBM DOS V2.6 1541 results. (Note that this message also appears when a @WP+/@WP− command actually executes. This command works on a 1541 only; any attempt to do an @WP+/@WP− on any other drive results in an ILLEGAL DEVICE NUMBER ERROR.)

An additional word of warning: This write-protection method *will not* prevent the DOS New command (@N:diskname,id) from formatting a disk, so be careful. Check the directory of a used disk and be sure you've backed up those important files before you reformat it.

Warm Stop, Cold Start

The @Q command is the normal method of disconnecting Disk Package (a "warm stop"). Since BASIC can operate as much as 10 percent slower when Disk Package is engaged, you might want to do an @Q in some situations where speed is critical. To reconnect Disk Package, simply type SYS 49152.

The new @! command is a more severe way of disconnecting Disk Package, working like a software reset button. It performs a cold start (similar to the SYS 64738 method), and any program in memory is wiped out.

The Disk Editing System

The most powerful aspect of Disk Package is the Disk Editing System. It allows you to view, alter, or make printer dumps of individual disk sectors. A word of warning: It's a good idea to have a thorough knowledge of how information is stored on a disk before using the Disk Editing System. *This portion of Disk Package is not for beginners.* Refer to your disk drive manual for details.

The @E command enters the Disk Editing System. While you're in it, BASIC is disabled, and you can't access any program in memory until you exit with the X command. This command doesn't affect either your program or any variables stored in memory. However, the Disk Editing System does require 256 bytes of free memory for its workspace. If that much space is not available, an OUT OF MEMORY ERROR results; however, it would take a very large program to cause that.

The first thing to do when editing a disk sector is to read it into the workspace with the R command. Type *R*, followed by the desired track and sector values (as two-digit hexadecimal numbers), separated by either a comma or a space. For example,

R12,01 or **R12 01**

would read track 18, sector 1 into the Disk Editing System's workspace. (This particular sector contains part of the directory on the 1541 and 1571 drives. If you own a 1581, enter R28,03 for a similar display.)

When a sector is read, only the first half (128 bytes) is displayed on the screen. A List command (L) prints at the end of the half-sector data. To examine the last 128 bytes, just press RETURN.

Note the format of each line listed. First there's an index byte, then eight data bytes (all shown as two-digit hexadecimal numbers), and then eight reverse-field ASCII characters corresponding to the eight data bytes. Disk Package prints these characters to give you an idea of what is actually stored on the disk sector. Be aware, though, that not all data bytes are displayable (for instance, the control characters, $00–$1F).

The List command does much more than just list half of a sector. You can list one line, two, or the entire sector, if you like. For one line (eight bytes), type *L*, followed by the index of the first data byte (in hexadecimal) that you want to view. To list more than one line, follow that first byte with a comma (or space) and then type the ending index (also in hexadecimal). For a quick scan of the entire sector, just type *L* and press RETURN. As the data scrolls by, hold the CTRL key to slow it down or press RUN/STOP to stop it.

Here are some examples of how to use the L command:

L	List entire sector.
L38	List one line (eight bytes, 38–3F).
L65,7D	List part of sector (bytes 65–84).

If you are either looking at the directory (track 18 on the 1541 and 1571, track 40 on the 1581) or scanning consecutive sectors of a file, the Next Sector command can help. Just type *N*, and Disk Package automatically executes a Read command, using the first two bytes of the current sector for the read (those first two bytes point to the next track and sector of the file). When the last sector of the file is read in, the program disables the N command until a different sector is read in. (You may type an *N* over the *L* on the L80,FF line when scanning a file—the N command will ignore any characters following it.)

Making Changes

Now comes the fun part—actually editing a disk sector. The Disk Editing System makes full use of the 64's built-in screen editor, so changing sector information is easy. Just use the L command to display whatever portion of the sector you want to change. Now use the cursor keys (but not the INST/DEL key) to move to the appropriate line. Make the necessary changes.

Let's say, for instance, you have this information on a disk, which you've listed to the screen:

.28: 57 45 52 20 31 4E 39 20 VER 1.9

If you want to change the 1.9 to 2.0, you need to look up the ASCII codes for the new characters, convert them to hexadecimal, and then place the new values over the old ones, like this:

Position cursor:
.28: 57 45 52 20 3 1 4E 39 20 VER 1.9

Type code for 2:
.28: 57 45 52 20 32 4E 39 20 VER 1.9

Reposition cursor:

.28: 57 45 52 20 32 4E 3 9 20 VER 1.9

Type code for 0:

.28: 57 45 52 20 32 4E 30 20 VER 1.9

Now press RETURN. The resulting changes appear in the reverse field characters on that line:

.28: 57 45 52 20 32 4E 30 20 VER 2.0

If you make a typing error or you change the wrong values, don't worry—you're only altering the editor's workspace, not the actual sector itself. Just change the values back and keep going until you're satisfied with your work. If you can't remember what you've changed, you can reread the sector with the R command and start over. (Typing *R* alone will recall the most recent sector read from disk and store it in the workspace.)

When you've made all the changes you want, write the contents of the workspace back onto the disk with the W (Write) command. The syntax for the Write command is the same as that of the Read command. If you happen to forget which sector you were editing, type a question mark followed by RETURN, and the track and sector values used by the most recent Read, Write, or Next Sector commands are displayed. That way, you can be sure of writing back to the same sector you read from.

If you wish to change a major portion of the sector (or all of it), the Z command can help. It will clear the workspace, filling it with zeros. You can clear one byte, eight bytes, or a whole sector. The syntax for the Z command is exactly the same as that of the L command. When entered properly, the Z command will list the bytes zeroed out when finished.

Printouts

Not only can you view sector information on the screen; you can also make a printout for later reference with the P command. To print, type *P*, followed by the device number (a single digit between 3 and 7), and either a question mark to display the current track and sector values or the optional index values used in displaying part of a sector. Here are some examples of the P command:

P4?	Send track and sector information to device 4.
P6	Print entire sector to device 6.
P7,23	Print one line to device 7.
P5,E0,FF	Print part of sector to device 5.

Compatibility

Software compatibility is always a problem for 64 users who do a lot of involved programming. Disk Package is designed to function as closely as possible to the DOS Wedge, so you should find that it's highly compatible with many programs. Since it isn't interrupt-driven, it should not interfere with utilities which are. Although Disk Package uses several memory locations throughout zero page and the BASIC/Kernal system variable area, most are used for temporary storage only while a command is executing, so there is little or no chance of conflict here as well.

Disk Package works well with BASIC programs. In fact, some Disk Package commands can work inside a BASIC program, with a slightly different syntax. For example, a BASIC program written to scratch a file, get the status, and offer to display a directory afterward looks like:

```
100 @"S0:filename":@""
110 PRINT:INPUT"VIEW DIREC-
    TORY";R$
120 IFLEFT$(R$,1)<>"Y"THENEND
130 @"$"
```

When using DOS commands inside a BASIC program, you must use quotation marks, even when requesting the drive status (note line 100). Disk Editing System commands are not allowed in a program, but you can enter the Editor from BASIC with the @"E" command. Note that some commands, like the soft write-protect and device-number change commands, will halt program execution immediately, so you might want to do a little experimenting. Despite these minor limitations, Disk Package and BASIC coexist peacefully most of the time.

Machine language programs are a different story. Obviously a program can't occupy the same memory locations Disk Package does, nor should it write to that area. Probably the best way to find out if Disk Package works with other utilities is to go ahead and install them—the worst that could happen is a lockup.

Disk Package has been tested with a number of utilities. Commodore's *Assembler Development System*, which was used to put Disk Package together, works very well. "64+," which appeared in the September 1987 issue of *COMPUTE!*, also works with Disk Package, as long as you install 64+ first. Make the following POKEs when using SHIFT-RUN/STOP with 64+ and Disk Package in tandem:

```
POKE60647,37:POKE60648,48:
  POKE60649,58
```

Some ML programs, such as "Supermon 64," are loaded as BASIC programs (starting at 2049/$0801). Most of these will not work with Disk Package, but once you exit that utility, Disk Package will still be there, ready to continue. *SpeedScript*, "Directory Magic" (October 1987), and many others also fall into this category. Unfortunately, Disk Package will not work with the Fastload cartridge, so it should be disabled before using the program. Other programs that won't work with Disk Package include "MetaBASIC" (February 1987) and almost all commercial software.

Other Drives

Disk Package is designed to work specifically with the 1541 disk drive, although it has been tested with the 1571 and 1581 and runs just as well (with the exception of @WP+ and @WP−). The standard DOS commands (Copy, Scratch, Validate, and so on) will still work on other drives, as should the Disk Editing System commands, but it's a good idea to experiment using a scratch disk to be certain.

Most of the features of Disk Package are also available on the 1764 RAM Expander, with the help of Program 2. This program acts as a go-between for the 1764 (with RAMDOS installed) and Disk Package.

Program 2, although written in machine language, also loads and runs like a BASIC program. When you run it, it installs itself at location 52224 ($CC00). Once in place, the program intercepts most of the commands entered via Disk Package and either executes special routines for the 1764 or aborts with an error message. For example, the 1764 does not support direct track and sector access, so an ILLEGAL DEVICE NUMBER error occurs whenever an @E command is attempted. For more information, refer to the Quick Reference Table above or the manual for the 1764. *Note: The 1764 Interface resides*

where the DOS Wedge (DOS 5.1) normally sits. If you need that area, you can disable 1764 Interface by SYSing to 49152.

System Hangups

On the rare side of occasionally, you'll find that the system will appear to lock up while trying to access a drive. The computer hasn't crashed—it's hung in a loop trying to access a device that for some reason isn't responding. The most common causes of a hangup include:

- Device number mismatch. The unit number was changed via software; then the drive was later reset, restoring its default setting. At this point, the user's sofware selection doesn't match the actual device number.
- Mismatch via @WP+/@WP−. These commands reset the drive before attempting to operate, causing the same mismatch problem mentioned above.
- Two or more drives have the same unit number. All devices must have their own unique device number.
- Drive lockup. To correct, reset the drive.
- In the case of the 1764 RAM Expander, improper installation of either RAMDOS or the 1764 Interface program. Disk Package must be in place *before* you install 1764 Interface. And when installing RAMDOS, be sure to select 207 as the interface block.

If any of these problems ever occur, press RUN/STOP–RESTORE, correct the situation, and try again.

A Powerful Tool

With or without the 1764 RAM Expansion Module, Disk Package is indeed a very powerful tool. With extra wedge commands and the added capabilities that Disk Package's Disk Editing System offers, you can do almost anything to a disk. You can lock files simply by changing their file-type bytes. You can rename a disk or change its ID. A "splat" file can be at least partially rescued by restoring the file-type byte, scanning the file, setting the last ungarbled sector so that it's the final sector, and then validating the disk. Your disk drive manual can be an invaluable reference tool for performing these types of operations.

See program listings on page 70.

MultiSort 128

James E. Borden

"MultiSort 128" allows your BASIC programs to sort both one- and two-dimensional string arrays at machine language speed—just what you need for custom-designed databases. For the Commodore 128 with disk drive.

Sorting string arrays from BASIC can be a trying experience; when you start shuffling around thousands—or even hundreds—of strings, BASIC slows to a crawl. You can use any of several good machine language sort routines to speed up the process, but most are limited to sorting one-dimensional arrays. "MultiSort 128" is more powerful; it can sort both simple one-dimensional arrays (lists) and two-dimensional arrays (matrices).

Suppose you have written a simple BASIC program to store the address file for your local user group. The program stores the names, addresses, and phone numbers of the group's members in a two-dimensional array (we'll use X$ in our example) as follows:

Column	Contents
0	name
1	address
2	city
3	state
4	zip code
5	phone number

To find the name of the third member, you would reference the first column of the third row, X$(2,0). (Remember to start counting from 0.) To find the zip code of the forty-third member, use X$(42,4).

This method of storing the address file works well until you need to alphabetize the file. Sorting the file from BASIC would be fairly simple, but it would also be slow. You could use a machine language routine, but most common ML routines sort only one-dimensional arrays or only one column of two-dimensional arrays. Such a routine would destroy your address file. With MultiSort, one SYS is all it takes to sort your address file on any column you like.

Typing It In

The program code for MultiSort is located in two banks for maximum speed. The routine in RAM 0 (the first 64K of memory in the 128) checks the variable name and value. If these are valid, the ML code in RAM 1 (the second 64K of memory in the 128) is called to do the actual work of comparing strings, swapping pointers, and fixing links. If an error occurs at any time, the code in RAM 0 also prints an *ARRAY ERROR IN ##* message.

Program 1, "Sort Maker," is a BASIC program that creates two machine language files on your disk. One file contains the code that resides in RAM 0; the other, the code in RAM 1. The DATA statements in Program 1 contain machine language instructions. If you make one error while typing them in, the sort routine could lock up

your machine or scramble your array instead of sorting it. To prevent typing errors, use "The Automatic Proofreader," found elsewhere in this issue.

Program 2, "Sort Demo," is a short BASIC program that demonstrates how MultiSort can be used to sort both one- and two-dimensional arrays. The first part of the demonstration fills a ten-row, four-column array and then sorts it according to the column you choose. Column 0 is filled with constant strings, column 1 is filled with numerical data, column 2 contains random characters, and column 3 contains only null strings. (We'll discuss MultiSort's treatment of null strings and numerical data in a moment.)

The second part of the demonstration allows you to check the time required to sort a 1000-element array. The program first creates 1000 random strings; then it sorts them. In Slow mode, it takes approximately 14 seconds to sort an array of 1000 strings. You can nearly double the speed of the sort by switching to Fast mode before sorting. To go to Fast mode, remove the REM in line 210. To return to Slow mode after the sort, remove the REM in front of the SLOW statement in line 250.

Sorting Syntax

The syntax for calling MultiSort is very simple. First make sure your program is in a bank that allows access to RAM 0 (bank 0, 14, or 15). Next, call MultiSort with the SYS command. Finally, specify the name of the array to sort and which column to sort on if it's a two-dimensional array. Here's an example of how to sort a one-dimensional array named XY$:

```
BANK15:SYS6912:XY$(0):REM SORT
  THE LIST XY$
```

The SYS must be followed by a colon, the name of the array, and a value in parentheses. For one-dimensional arrays, any number or variable in the range 0–255 can be used. (In simple lists, the value is only a dummy.) If any of these are missing or invalid, a syntax error results. After the SYS command has executed, array XY$ is sorted in ascending order.

Sorting a two-dimensional array is a little more complicated. For matrices, the number within parentheses refers to the column by which you wish to sort. For example, you could use DIM A$(99,4) to create a 100-line × 5-column array named A$. The second number in the DIM statement is the maximum value allowed in the sort call. Assume that in this array, column 0 is not used (all null strings), column 1 contains the name, column 2 holds the address, column 3 contains the city, and column 4 holds the state. To sort the array by name, use

```
BANK15:SYS6912:A$(1):REM SORT BY
  NAME COLUMN
```

Or, to sort the array by state, use

```
BANK15:SYS6912:A$(4):REM SORT BY
  STATE COLUMN
```

Keep in mind that you are sorting strings, not numbers. If you have strings of numbers, you must pad them with leading spaces so that the ones column lines up. If you sort "5," "10," and "2," they come out in the order "10," "2," and "5." To sort these numbers correctly, you must enter them as " 5," "10," and " 2."

Many programmers do not use element 0 of an array. Therefore, if element 0 of the sort column contains a null string, it is left there after the sort. A null string in any other position is moved to the end of the array. If this is a problem, use a space to represent empty strings.

If you pass invalid data after the SYS command (an undimensioned array or illegal column, for example), the program will print *ARRAY ERROR IN* ## and ring the bell. A little care should prevent this from happening. Also, although it should not be a problem, arrays or columns containing all null strings will return an *EMPTY ARRAY ERROR IN* ## message. (See the first part of the demonstration.) Having fewer than three valid strings also produces the *EMPTY ARRAY ERROR* message. (If you have that few items to sort, you can sort them with a simple IF-THEN statement.)

After you've sorted the array, check location 6. If the value stored there is not 0, an error has occurred. (See lines 160 and 240 of the demonstration program.) If an error has occurred, MultiSort will have printed an error message, and either your program can go back, modify the array, and sort again, or it can end.

One final caution about sorting two-dimensional arrays: Although all data will be swapped correctly, if there are two related fields, such as last and first names, the sort might appear to be incorrect. A section of such an array might look like this after a sort by last name:

(X)	A$(X,1)	A$(X,2)
50	SLIP	JAMES
51	SMITH	ROBERT
52	SMITH	MIKE
53	SPOT	BOB

Notice that the sort column (column 1) is in order, but the first-name column (column 2) is not (*Mike* should precede *Robert*). There is no way to sort by two fields at the same time, but an easy way to work around this is to sort by the first-name field and then by the last name.

A Note to Programmers

The sort program uses 146 bytes in RAM 0 ($1B00–$1B91) and 1048 bytes in RAM 1 ($0400–$0817). It also uses several zero-page locations ($05–$08 and $64–$6F) but should not interfere with any other ML routines you are using. Locations $FB–$FE are not used by MultiSort.

See program listings on page 82.

The Write Stuff 64/128 WORD PROCESSORS

* *Over 2 years in development. All machine language.*
* *User tested and approved by 130 user groups, 5000 members.*
* *Menu driven for beginners, children, and occasional users.*
* *Command driven for the power user--100+ advanced features.*
* *Selected for use in both elementary and high schools.*
* *Supported with newsletter, BBS, and laser printing service.*

BB Writer 64 Ease of use AND high productivity
Load/Edit/Print/Help menus, 22K text, 9K buffer, fast 80-column video preview, 60 help files, 3 help screens, all the usual features plus: double-column printing, macrotyping (reduce typing 25%), auto-capitalizing of sentences, mail merge, sort columns, Dvorak, dual text areas, encryption, calculator, built-in file translator, 20 printer macros & 16 toggles for complete control of printer.

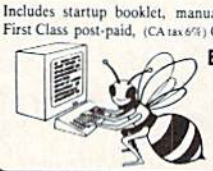
BB Talker 64 The talking word processor
Perfect for children. Can recite all or part of text, spell words, say characters, read menu choices/help screens. Change pitch, speed, voice (9 different voices). Includes talking story book with 30+ nursery rhymes, fables, songs, fairy tales. No special hardware required. Great fun for kids of all ages.

BB Writer 128 Far more than the 64 version
Over, 3 dozen new and improved features; fully exploits the 128. 63K text, 16K buffer, both 40 & 80-column versions, 1-10 text areas, 60 keyboard macros, outliner, auto numbering of lists, split screen option, 32 printer macros each can send 32 codes, micro justification, Roman page numbering, batch search & replace, supports 1525 to laser printers. Easily the highest productivity 128 word processor available (used to print this ad!).

Free brochure for the asking--a full-page ad couldn't describe all the features. Try before you buy? Sure! It'll cost us $2.50 to send you a demo version with booklet. Send a token $1 and we'll eat the rest (seeing is believing). But why waste your time and money? Order the *real* stuff today.

BB Writer 64 $19.95 BB Writer 64 + BB Talker 64 $24.95
BB Writer 128 $29.95 BB Writer 128 + BB Talker 64 $34.95

Includes startup booklet, manual, keyboard overlay, utilities. First Class post-paid, (CA tax 6%) COD or 2d-Day Air add $2.25



Busy Bee Software
P.O. Box 2959
Lompoc, CA 93438
(805) 736-8184
MC/VISA. We ship daily.
Dealer inquires welcome.

news & products

New Products from Epyx

Home Video Producer, a new release from Epyx, lets 64 and 128 owners put their systems to work enhancing home videos with graphics, borders and typefaces, wipes, and scrolls. The package is due out in the second half of the year and is priced at $49.95.

Two new products announced for the company's U.S. Gold line are *Tower Toppler*, filled with monsters from alien oceans, and *Technocop*, with futuristic police action; each is priced at $39.95.

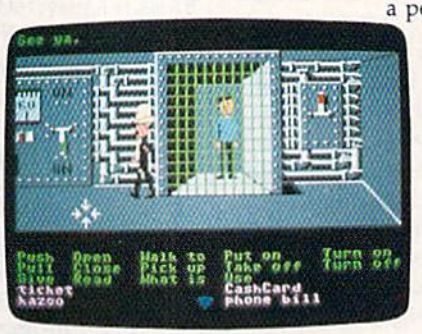
Battleship is Epyx's computer translation of the classic board game; suggested retail is $29.95. *Final Assault* ($39.95) is a mountain-climbing challenge complete with pitons. *Street Sports Football* moves the pigskin from astroturf to asphalt; it carries a price of $39.95. The latest in Epyx's Masters Collection is *The Legend of Blacksilver*, a fantasy priced at $39.95. *Mind-Roll* is a 3-D strategy game priced at $39.95. Seoul is the setting for *The Games—Summer Edition*, a $39.95 package whose design includes input from athletes themselves.

Epyx, 600 Galveston Dr., Redwood City, CA 94063

Circle Reader Service Number 201.

New Name, New Games

Activision has changed its name to Mediagenic while retaining the Activision moniker for a particular line of games. Several new Commodore 64 titles from this veteran software-publishing house have been announced. Charlie Hustle makes the transition from home plate to home computer in *Pete Rose Pennant Fever*, due in November for the Commodore 64 at $34.95, from Mediagenic's Gamestar line. The program simulates baseball play, with an added opportunity for the player to assume the role of a general manager who must build a pennant-worthy team without spending himself bankrupt. Activision's U.S.S. *Ocean Ranger* gives players the next generation in guided-missile technology, and it challenges them to face the next generation of risks in global hot spots including the Persian Gulf and Southeast Asia; suggested retail is $34.95. Warriors weary of the sea can press into the jungle in Activision's software version of *Predator*, the Schwarzenegger hit that pitted Arnold against the alien. *Predator* is set for release in September at $29.95.



Zak McKracken and the Alien Mindbenders

Ever read those tabloids at grocery-store checkout counters? So do the programmers at Lucasfilm Games. *Zak McKracken and the Alien Mindbenders*, coming in July at $34.95, puts the player in the role of a tabloid reporter in hot pursuit of a stunning scoop. The game extends the interface made popular in last year's *Maniac Mansion*.

Interplay announced *Neuromancer*, a game based on William Gibson's award-winning science-fiction novel. *Neuromancer* combines adventure, role-playing, and simulation, and features a soundtrack by Devo. The game should be available by the time you read this, at a suggested retail price of $39.95.

Mediagenic, P.O. Box 7286, Mountain View, CA 94039

Circle Reader Service Number 203.

New Titles for Sports Lovers

Accolade has announced several new titles for the 64. *Serve and Volley*, a tennis simulation priced at $29.95, combines tennis action with strategic decisions such as ball placement, serve selection, and a variety of hitting styles.

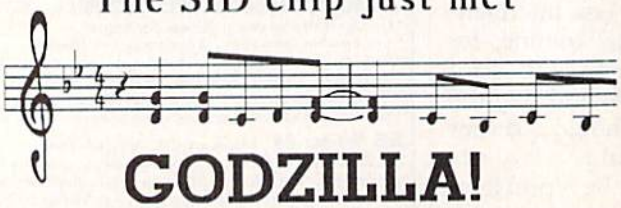
T.K.O. gives players boxing matches complete with black eyes, cuts, and bruises. Priced at $29.95, *T.K.O.* uses split screens to enhance the player's sense of the boxing experience.

Fast Break is Accolade's basketball game. Designed by Steve Cartwright, the $29.95 game can be played solitaire or with two players, and it uses an interface similar to the one in *Hardball* and *4th and Inches*.

Rack 'Em a $29.95 billiard/pool simulation, includes snooker, bumper pool, eightball, nineball, and straight pool.

Accolade, 550 S. Winchester Blvd., Suite 200, San Jose, CA 95128.

Circle Reader Service Number 205.

The SID chip just met

GODZILLA!

Forget about cute little bleeps and squonks, we're talking 9-voice Yamaha FM music synthesizer with optional real 5-octave piano keyboard and a composer & voice editor program that Beethoven would have traded the Fifth for!

If you're talking music on the C64/C128 you're talking

SFX SOUND EXPANDER,

9 independently programmable voices and MIDI capability. And if that's not enough there's our **SFX SOUND SAMPLER** complete with microphone and software, also MIDI capable.

For the real lowdown fill out the coupon and drop it in the mail, or just give us a **TOLL-FREE call at (800) 447-3434 (in California call 805 925-6682).**

FEARN & MUSIC
519 W. Taylor #114
Santa Maria
CA 93454

It sounds great, please send me more FREE information about the SFX Sound Expander and SFX Sound Sampler!

NAME

CITY STATE ZIP

FEARN & MUSIC
519 W. Taylor #114
Santa Maria
CA 93454

BEFORE TYPING . . .

Before typing in programs, please refer to "How to Type In COMPUTE!'s GAZETTE Programs," elsewhere in this issue.

SpeedCheck 128

See instructions in article on page 60 before typing in.

```
1C01:0C 1C 0A 00 9E 20 37 31 9C
1C09:38 35 00 00 00 DB DB DB AD
1C11:A9 00 8D 00 FF 20 7D FF 4B
1C19:93 0E 0B 20 20 20 20 20 E3
1C21:20 20 20 20 20 20 20 20 59
1C29:D3 50 45 45 44 C3 48 45 63
1C31:43 4B 20 31 32 38 0D 0D 8E
1C39:20 20 20 C3 4F 50 59 52 8A
1C41:49 47 48 54 20 31 39 38 AE
1C49:38 20 C3 CF CD D0 D5 D4 4D
1C51:C5 21 20 D0 55 42 2E 2C 02
1C59:20 C9 4E 43 2E 0D 20 20 18
1C61:20 20 20 20 20 20 20 20 99
1C69:20 C1 4C 4C 20 D2 49 47 96
1C71:48 54 53 20 D2 45 53 45 E6
1C79:52 56 45 44 0D 0D 0D 00 14
1C81:A9 00 8D 00 24 8D D0 23 5C
1C89:20 7D FF C5 4E 54 45 52 2E
1C91:20 46 49 4C 45 20 4E 41 E1
1C99:4D 45 3A 20 00 20 E9 22 89
1CA1:20 FC 22 A9 00 A2 00 A0 33
1CA9:04 20 D5 FF 8E C1 23 8C F4
1CB1:C2 23 C9 04 D0 17 20 7D 2E
1CB9:FF 0D 11 CE CF 20 D3 D5 C0
1CC1:C3 C8 20 C6 C9 CC C5 11 9C
1CC9:0D 00 4C 89 1C 86 FE 84 28
1CD1:FF A9 FE 8D B9 02 A9 FF 56
1CD9:A2 01 20 77 FF 20 7D FF 9A
1CE1:93 C9 4E 53 45 52 54 20 91
1CE9:44 49 43 54 49 4F 4E 41 A9
1CF1:52 59 20 44 49 53 4B 2E 4E
1CF9:2E 2E 00 20 E4 FF F0 FB DB
1D01:20 B3 77 A9 41 8D C6 23 B2
1D09:AD C6 23 38 E9 40 8D CD EC
1D11:23 20 8B 1E 20 2D 1F 20 4C
1D19:6C 22 20 E1 FF F0 0A EE FA
1D21:C6 23 AD C6 23 C9 5B D0 71
1D29:DF 20 C4 77 AD D0 23 F0 53
1D31:39 20 7D FF 93 D6 41 4C 86
1D39:49 44 41 54 49 4E 47 20 C8
1D41:44 49 43 54 49 4F 4E 41 03
1D49:52 59 2E 2E 2E 0D 00 20 71
1D51:1C 23 A9 56 20 D2 FF 20 69
1D59:CC FF A9 0F 20 C3 FF 20 50
1D61:1C 23 20 CC FF A9 0F 20 28
1D69:C3 FF A9 93 20 D2 FF 20 60
1D71:7D FF D3 50 45 4C 4C 49 27
1D79:4E 47 20 43 48 45 43 4B 0E
1D81:20 43 4F 4D 50 4C 45 54 ED
1D89:45 2E 0D 00 AD 00 24 D0 1A
1D91:01 60 20 7D FF 11 C5 44 54
1D99:49 54 53 20 57 45 52 45 B3
1DA1:20 4D 41 44 45 20 54 4F 4E
1DA9:20 54 45 58 54 0D 00 20 2E
1DB1:7D FF 52 45 2D 53 41 56 D8
1DB9:45 20 54 45 58 54 20 28 F9
1DC1:D9 2F CE 29 00 20 E4 FF 6B
1DC9:C9 59 F0 05 C9 4E D0 F5 CC
1DD1:60 20 7D FF 93 C9 4E 53 A7
1DD9:45 52 54 20 54 45 58 54 94
1DE1:20 46 49 4C 45 20 44 49 28
1DE9:53 4B 2E 2E 2E 0D 00 20 0F
1DF1:7D FF 11 C5 4E 54 45 52 0A
1DF9:20 46 49 4C 45 4E 41 4D F6
1E01:45 3A 20 00 EE AB 23 EE CD
1E09:AB 23 EE AB 23 A0 00 B9 D1
1E11:AE 23 20 D2 FF C8 CC AB 07
1E19:23 D0 F4 20 7D FF 0D 91 53
1E21:1D 1D 1D 1D 1D 1D 1D 1D 5D
1E29:1D 1D 1D 1D 1D 1D 1D 1D 65
1E31:00 20 E9 22 AD B1 23 C9 19
1E39:40 D0 38 A9 53 8D B1 23 C2
1E41:20 1C 23 A2 00 BD B1 23 A0
1E49:20 D2 FF E8 EC AB 23 D0 06
1E51:F4 20 CC FF A9 0F 20 C3 37
1E59:FF CE AB 23 CE AB 23 CE 2B
1E61:AB 23 A2 00 A0 03 B9 B1 C6
1E69:23 9D B1 23 C8 E8 EC AB 76
1E71:23 D0 F3 20 FC 22 A9 00 B7
1E79:85 FC A9 04 85 FD A9 FC A1
1E81:AE C1 23 AC C2 23 20 D8 70
1E89:FF 60 A9 00 8D FE 23 20 E1
1E91:CC FF 20 7D FF 0D 4C 4F 2C
1E99:41 44 49 4E 47 20 00 AD FD
1EA1:C6 23 20 D2 FF A9 0D 20 1C
1EA9:D2 FF AE C7 23 A0 01 B9 F8
1EB1:C7 23 A8 A9 01 20 BD FF 4E
1EB9:A9 00 A2 00 20 68 FF A9 6B
1EC1:02 A2 08 A0 00 20 BA FF A8
1EC9:AD 02 24 8D C9 23 A0 01 D7
1ED1:B9 02 24 8D CA 23 A9 00 FE
1ED9:AE C9 23 AC CA 23 20 D5 08
1EE1:FF 8E CB 23 8C CC 23 86 D1
1EE9:FC 84 FD 48 A9 FC 8D B9 20
1EF1:02 A0 00 A2 00 A9 00 20 48
1EF9:77 FF 68 C9 04 F0 06 A9 35
1F01:01 8D FF 23 60 AD CD 23 CD
1F09:8D 04 24 AD C9 23 85 FC 51
1F11:AD CA 23 85 FD 20 38 23 99
1F19:A9 00 91 FC A5 FC 8D CB 36
1F21:23 A5 FD 8D CC 23 A9 00 39
1F29:8D FF 23 60 A9 00 85 FE EF
1F31:A9 04 85 FF 20 4A 1F C9 28
1F39:00 F0 01 60 20 AF 1F C9 A1
1F41:00 F0 F1 20 06 20 18 90 6D
1F49:EB A0 00 A9 FE A2 01 20 E4
1F51:74 FF 20 46 23 C9 FF D0 43
1F59:03 A9 01 60 C9 20 D0 06 20
1F61:20 3F 23 18 90 E3 CD CD E2
1F69:23 F0 06 20 96 1F 18 90 2A
1F71:D8 A9 FE A2 01 C8 20 74 70
1F79:FF 20 46 23 C9 FF F0 04 EE
1F81:C9 20 D0 ED CC CF 23 B0 42
1F89:06 20 96 1F 18 90 BA 8C 9C
1F91:FD 23 A9 00 60 20 3F 23 F1
1F99:A0 00 A2 01 A9 FE 20 74 8A
1FA1:FF 20 46 23 C9 FF D0 01 D3
1FA9:60 C9 20 D0 E8 60 AD C9 89
1FB1:23 85 FC AD CA 23 85 FD 49
1FB9:A9 FC 8D C8 02 A0 00 A9 86
1FC1:FE A2 01 20 74 FF 20 46 74
1FC9:23 A2 00 20 7A FF D0 1B D4
1FD1:C8 CC FD 23 D0 E9 A9 FC 18
1FD9:A2 00 20 74 FF C9 20 F0 0D
1FE1:04 C9 00 D0 06 20 96 1F 9E
1FE9:A9 00 60 A0 00 A9 FC A2 56
1FF1:00 20 74 FF 20 38 23 C9 B8
1FF9:00 D0 03 A9 01 60 C9 20 A4
2001:D0 EB 18 90 BA 20 C4 77 08
2009:A9 93 20 D2 FF A9 12 20 1F
2011:D2 FF A9 00 8D 01 24 A5 4E
2019:FE 8D FB 23 A5 FF 8D FC 33
2021:23 A0 00 A9 FE A2 01 20 5A
2029:74 FF 20 6E 23 20 D2 FF CD
2031:20 3F 23 EE 01 24 AD 01 99
2039:24 CD FD 23 D0 E5 A9 92 F4
2041:20 D2 FF A9 FE A2 01 20 85
2049:74 FF 48 20 46 23 C9 FF 21
2051:D0 04 68 4C 83 20 68 20 5A
2059:6E 23 48 AD CE 23 F0 11 73
2061:A9 12 20 D2 FF 68 20 D2 E0
2069:FF A9 92 20 D2 FF 18 90 BF
2071:04 68 20 D2 FF 20 3F 23 21
2079:EE 01 24 AD 01 24 C9 28 25
2081:D0 C1 AD FB 23 85 FE AD EA
2089:FC 23 85 FF 20 7D FF 13 CB
2091:0D 11 11 11 11 11 11 11 CF
2099:12 C1 92 44 44 2C 20 12 0F
20A1:C5 92 44 49 54 2C 20 12 2C
20A9:D3 92 4B 49 50 3F 20 0D 43
20B1:00 20 E4 FF C9 41 F0 14 DF
20B9:C9 45 F0 6D C9 53 D0 F1 54
20C1:A9 93 20 D2 FF 20 B3 77 4C
20C9:20 96 1F 60 A9 93 20 D2 58
20D1:FF 20 B3 77 AD CB 23 85 70
20D9:FC AD CC 23 85 FD A9 01 48
20E1:8D FE 23 A0 00 A9 FC 8D 45
20E9:B9 02 A9 20 A2 00 20 77 8B
20F1:FF 20 38 23 A2 01 A9 FE DE
20F9:20 74 FF 20 46 23 A2 00 6D
2101:20 77 FF C8 CC FD 23 D0 33
2109:EB A9 00 A2 00 20 77 FF 45
2111:AC FD 23 20 38 23 88 D0 BF
2119:FA A0 00 A5 FC 8D CB 23 34
2121:A5 FD 8D CC 23 20 96 1F 1A
2129:60 A9 01 8D 00 24 20 7D 4D
2131:FF 11 C5 4E 54 45 52 20 D1
2139:4E 45 57 20 57 4F 52 44 C1
2141:3A 20 00 A0 00 20 CF FF D2
2149:48 20 9A 23 99 D1 23 C8 60
2151:68 C9 0D D0 F0 88 8C F9 A5
2159:23 A9 93 20 D2 FF 20 B3 96
2161:77 CC FD 23 D0 03 4C 56 06
2169:22 B0 03 4C F0 21 AD F9 6F
2171:23 38 ED FD 23 8D FA 23 59
2179:AD C1 23 85 FC AD C2 23 07
2181:85 FD A0 00 EE C1 23 D0 AF
2189:03 EE C2 23 C8 CC FA 23 26
2191:D0 F2 A5 FE 8D FB 23 A5 E5
2199:FF 8D FC 23 AD C1 23 85 51
21A1:FE AD C2 23 85 FF A0 00 C6
21A9:A9 FE 8D B9 02 20 E3 21 47
21B1:C6 FE A9 FF C5 FE D0 02 1A
21B9:C6 FF C6 FC A9 FF C5 FC DD
21C1:D0 02 C6 FD A5 FD CD FC 63
21C9:23 D0 E2 A5 FC CD FB 23 C2
21D1:D0 DB 20 E3 21 AD FB 23 90
21D9:85 FE AD FC 23 85 FF 4C 9F
21E1:56 22 A2 01 A9 FC 20 74 32
21E9:FF A2 01 20 77 FF 60 AD 21
21F1:FD 23 38 ED F9 23 8D FA 54
21F9:23 A5 FE 85 FC 8D FB 23 A8
2201:A5 FF 85 FD 8D FC 23 AC FB
2209:FA 23 20 3F 23 88 D0 FA 63
2211:A0 00 A9 FC 8D B9 02 20 22
2219:49 22 20 38 23 20 3F 23 4D
2221:A5 FF CD C2 23 D0 F0 A5 02
2229:FE CD C1 23 D0 E9 20 49 82
2231:22 A5 FC 8D C1 23 A5 FD 4C
2239:8D C2 23 AD FB 23 85 FE AA
2241:AD FC 23 85 FF 4C 56 22 58
2249:A2 01 A9 FE 20 74 FF A2 B9
2251:01 20 77 FF 60 A0 00 A9 3C
2259:FE 8D B9 02 B9 D1 23 A2 D5
2261:01 20 77 FF C8 CC F9 23 AD
2269:D0 F2 60 AD FE 23 D0 01 E0
2271:60 20 7D FF 93 11 11 20 C0
2279:20 D5 50 44 41 54 49 4E CD
2281:47 20 44 49 43 54 49 4F DB
2289:4E 41 52 59 2E 2E 2E 00 AB
2291:EE D0 23 AD FF 23 F0 03 32
2299:20 D0 22 AE C7 23 A0 01 5E
22A1:B9 C7 23 A8 A9 01 20 BD F2
22A9:FF A9 00 A2 00 20 68 FF D3
22B1:A9 02 A2 08 A0 00 20 BA 20
22B9:FF AD C9 23 85 FC AD CA 1B
22C1:23 85 FD A9 FC AE CB 23 B0
22C9:AC CC 23 20 D8 FF 60 20 A5
22D1:1C 23 A2 00 BD C3 23 20 A4
22D9:D2 FF E8 E0 04 D0 F5 20 22
22E1:CC FF A9 0F 20 C3 FF 60 23
22E9:A0 00 20 CF FF C9 0D F0 B1
22F1:06 99 B1 23 C8 D0 F3 8C 06
22F9:AB 23 60 AE AC 23 A0 01 08
2301:B9 AC 23 A8 AD AB 23 20 C0
2309:BD FF A9 01 A2 00 20 68 31
2311:FF A9 02 A2 08 A0 00 20 0F
2319:BA FF 60 A9 00 20 BD FF 5F
2321:A2 00 20 68 FF A9 0F A2 AA
2329:08 A0 0F 20 BA FF 20 C0 56
2331:FF A2 0F 20 C9 FF 60 E6 F9
2339:FC D0 02 E6 FD 60 E6 FE 1F
2341:D0 02 E6 FF 60 48 A5 FF BC
2349:CD C2 23 90 0B A5 FE CD 4F
2351:C1 23 90 04 68 A9 FF 60 DD
2359:68 C9 41 90 08 C9 5B B0 46
2361:09 38 E9 40 60 C9 1B B0 8C
2369:01 60 A9 20 60 48 A2 00 E8
```

```
2371:8E CE 23 29 80 F0 09 68 EB
2379:29 7F 48 A9 01 8D CE 23 D6
2381:68 C9 20 B0 04 18 69 40 11
2389:60 C9 40 B0 01 60 C9 60 03
2391:B0 03 69 20 60 18 69 40 96
2399:60 C9 40 B0 01 60 C9 C1 74
23A1:B0 04 38 E9 40 60 38 E9 C4
23A9:80 60 EA B1 23 40 30 3A 75
23B1:20 20 20 20 20 20 20 20 F7
23B9:20 20 20 20 20 20 20 20 FF
23C1:EA EA 53 30 3A EA C6 23 D3
23C9:EA EA EA EA EA EA 05 00 59
23D1:20 20 20 20 20 20 20 20 18
23D9:20 20 20 20 20 20 20 20 20
23E1:20 20 20 20 20 20 20 20 28
23E9:20 20 20 20 20 20 20 20 30
23F1:20 20 20 20 20 20 20 20 38
23F9:EA EA EA EA EA EA EA EA 40
2401:EA 04 24 EA 00 00 00 00 F2
```

Pattern Fill

See instructions in article on page 54 before typing in.

```
C000:20 AD C2 20 AB C4 4C 0E 6E
C008:C2 00 00 00 00 00 00 00 EA
C010:00 00 00 00 00 00 00 00 91
C018:00 00 00 00 00 00 00 00 99
C020:00 00 00 00 00 00 A2 00 E6
C028:BD 0A C0 9D 10 C0 E8 E0 33
C030:03 90 F5 60 A2 00 BD 0D B9
C038:C0 9D 10 C0 E8 E0 03 90 F0
C040:F5 60 A9 00 8D 24 C0 A5 2E
C048:C5 C9 3E D0 01 60 C9 11 22
C050:D0 0C AD 13 C0 8D 0D C0 3B
C058:AD 14 C0 8D 0E C0 20 9F F9
C060:C1 F0 0E 20 78 C1 AD 0C F4
C068:C0 C9 C8 90 01 60 4C C5 C6
C070:C0 20 07 C2 D0 16 20 78 FE
C078:C1 20 07 C2 D0 05 A9 01 DE
C080:8D 24 C0 20 55 C1 20 E9 C7
C088:C1 4C 5E C0 20 91 C1 AD 4E
C090:24 C0 D0 01 60 20 78 C1 B4
C098:AD 0C C0 C9 C8 90 01 60 93
C0A0:20 07 C2 D0 10 20 9F C1 5B
C0A8:F0 03 4C C5 C0 20 07 C2 A0
C0B0:F0 F3 4C C5 C0 20 91 C1 F8
C0B8:20 74 C4 F0 03 4C C5 C0 A4
C0C0:20 07 C2 D0 F0 A9 00 8D 35
C0C8:24 C0 A5 C5 C9 3E D0 01 87
C0D0:60 C9 2A D0 0C AD 16 C0 4B
C0D8:8D 0D C0 AD 17 C0 8D 0E 3C
C0E0:C0 20 91 C1 AD 0A C0 C9 F9
C0E8:40 90 13 AD 0B C0 F0 0E 37
C0F0:20 78 C1 AD 0C C0 C9 C8 73
C0F8:90 01 60 4C 42 C0 20 07 30
C100:C2 D0 16 20 78 C1 20 07 EF
C108:C2 D0 05 A9 01 8D 24 C0 A3
C110:20 55 C1 20 E9 C1 4C E1 04
C118:C0 20 9F C1 AD 24 C0 D0 64
C120:01 60 20 78 C1 AD 0C C0 65
C128:C9 C8 90 01 60 20 07 C2 39
C130:D0 13 20 91 C1 20 74 C4 3A
C138:F0 03 4C 42 C0 20 07 C2 F9
C140:F0 F0 4C 42 C0 20 9F C1 AD
C148:F0 03 4C 42 C0 20 07 C2 0A
C150:D0 F3 4C 42 C0 CE 0C C0 01
C158:CE 0F C0 AD 15 C0 D0 07 4E
C160:AD 0F C0 C9 FF F0 08 AD B4
C168:0F C0 CD 15 C0 B0 06 AD 31
C170:18 C0 8D 0F C0 4C C2 C2 52
C178:EE 0C C0 EE 0F C0 AD 0F 63
C180:C0 CD 18 C0 F0 08 90 06 B5
C188:AD 15 C0 8D 0F C0 4C C2 EF
C190:C2 20 2B C4 EE 0A C0 D0 21
C198:03 EE 0B C0 4C C2 C2 CE 88
C1A0:0D C0 AD 0D C0 C9 FF D0 5F
C1A8:11 A9 00 8D 0E C0 AD 13 D9
C1B0:C0 D0 07 AD 0D C0 C9 FF 83
C1B8:F0 08 AD 0D C0 CD 13 C0 61
C1C0:B0 14 AD 0E C0 CD 14 C0 5E
C1C8:D0 0C AD 16 C0 8D 0D C0 E5
C1D0:AD 17 C0 8D 0E C0 CE 0A FC
C1D8:C0 AD 0A C0 C9 FF D0 03 68
C1E0:CE 0B C0 20 C2 C2 4C 54 B6
C1E8:C4 20 34 C0 AD 8D 02 C9 DA
C1F0:04 F0 08 20 1C C4 F0 0E 99
C1F8:4C 00 C2 20 1C C4 D0 06 98
C200:20 26 C0 20 24 C4 60 20 4E
C208:26 C0 20 1C C4 60 20 E9 68
C210:C2 A5 C5 C9 39 D0 03 4C 15
C218:85 C4 C9 01 D0 03 4C 00 06
C220:C0 AD 00 DC 29 10 D0 03 6D
C228:20 75 C2 AD 00 DC 29 0F 23
C230:C9 0F F0 DA C9 0E D0 08 5A
C238:AD 0C C0 F0 D1 20 55 C1 3A
C240:C9 0D D0 0A AD 0C C0 C9 91
C248:C7 B0 C3 20 78 C1 C9 07 BD
C250:D0 0F AD 0A C0 C9 3F D0 D4
C258:05 AD 0B C0 D0 B0 20 91 54
C260:C1 C9 0B D0 0D AD 0A C0 9B
C268:D0 05 AD 0B C0 F0 9F 20 27
C270:9F C1 4C 0E C2 AD 23 C0 74
C278:D0 18 A2 00 BD 0A C0 9D F5
C280:13 C0 E8 E0 03 90 F5 EE 20
C288:23 C0 AD 00 DC 29 10 F0 22
C290:F9 60 C9 01 D0 13 A2 00 8C
C298:BD 0A C0 9D 16 C0 E8 E0 D7
C2A0:03 90 F5 EE 23 C0 4C 8A B8
C2A8:C2 20 C5 C0 60 A9 01 8D 95
C2B0:15 D0 8D 38 0A A9 6F 8D 8D
C2B8:F8 5F A9 05 8D 27 D0 20 E2
C2C0:F4 C2 AD 0C C0 18 69 32 53
C2C8:8D 01 D0 AD 0A C0 18 69 37
C2D0:18 8D 00 D0 90 06 A9 01 C3
C2D8:8D 10 D0 60 AD 0B C0 C9 2E
C2E0:FF D0 02 A9 00 8D 10 D0 9C
C2E8:60 A2 00 A0 0C CA D0 FD 7C
C2F0:88 D0 FA 60 A2 00 BD 0E F2
C2F8:C3 9D C0 5B E8 E0 3F 90 6F
C300:F5 A2 00 A9 00 9D 09 C0 0F
C308:E8 E0 1D 90 F8 60 FF 00 32
C310:00 E0 00 00 B0 00 00 98 ED
C318:00 00 8C 00 00 86 00 00 4B
C320:83 00 00 81 80 00 00 C0 46
C328:00 00 60 00 00 30 00 00 7C
C330:18 00 00 0C 00 00 08 00 94
C338:00 00 00 00 00 00 00 00 BF
C340:00 00 00 00 00 00 00 00 C7
C348:00 00 00 00 00 AD 11 C0 69
C350:4A AD 10 C0 6A 4A 4A 8D 15
C358:19 C0 AD 12 C0 4A 4A 4A 81
C360:8D 20 C0 AD 12 C0 29 07 96
C368:8D 1C C0 AE 20 C0 A9 00 18
C370:8D 21 C0 8D 22 C0 E0 00 CD
C378:F0 15 AD 21 C0 18 69 40 FE
C380:8D 21 C0 90 03 EE 22 C0 11
C388:EE 22 C0 CA 4C 76 C3 8E 27
C390:1E C0 8E 1F C0 AD 19 C0 CA
C398:18 0A 0A 0A 90 03 EE 1F 1E
C3A0:C0 18 6D 1C C0 8D 1E C0 37
C3A8:90 03 EE 1F C0 AD 21 C0 C8
C3B0:18 6D 1E C0 8D 1E C0 90 66
C3B8:03 EE 1F C0 AD 22 C0 18 FC
C3C0:6D 1F C0 8D 1F C0 A9 60 67
C3C8:18 6D 1F C0 8D 1F C0 AD BF
C3D0:10 C0 29 07 8D 1B C0 A9 2A
C3D8:07 38 ED 1B C0 8D 1B C0 94
C3E0:AE 1B C0 BD 02 C4 8D 09 C1
C3E8:C0 AD 1F C0 85 22 AD 1E 5A
C3F0:C0 85 21 A0 00 AD 1A C0 14
C3F8:F0 10 B1 21 0D 09 C0 91 E4
C400:21 60 01 02 04 08 10 20 F2
C408:40 80 A9 00 8D 1D C0 85 EE
C410:02 B1 21 2D 09 C0 8D 1D 81
C418:C0 85 02 60 A9 00 8D 1A 2C
C420:C0 4C 4D C3 A9 01 8D 1A 89
C428:C0 D0 F6 EE 0D C0 D0 05 26
C430:A9 01 8D 0E C0 AD 0D C0 F8
C438:CD 16 C0 90 16 F0 14 AD 99
C440:0E C0 CD 17 C0 D0 0C AD 3B
C448:13 C0 8D 0D C0 AD 14 C0 B3
C450:8D 0E C0 60 AD 0A C0 C9 23
C458:FF D0 15 AD 0B C0 C9 FF 82
C460:D0 0E A9 00 8D 0A C0 8D AE
C468:0B C0 20 2B C4 A9 FF 60 8B
C470:A9 00 F0 FB AD 0A C0 C9 8D
C478:40 D0 F5 AD 0B C0 C9 01 DF
C480:D0 EE A9 FF 60 AD 02 DD FE
C488:09 03 8D 02 DD AD 00 DD AC
C490:29 FC 09 03 8D 00 DD A9 11
C498:15 8D 18 D0 A9 1B 8D 11 06
C4A0:D0 A9 00 85 C6 A9 00 8D BF
C4A8:15 D0 60 AD 02 DD 09 03 74
C4B0:8D 02 DD AD 00 DD 29 FC DE
C4B8:09 02 8D 00 DD AD 18 D0 9F
C4C0:29 0F 09 78 8D 18 D0 AD 67
C4C8:11 D0 09 20 8D 11 D0 A9 2E
C4D0:5B 85 38 60 00 00 00 00 76
```

Disk Package

See instructions in article on page 62 before typing in.

Program 1: Disk Package

```
0801:1E 08 00 FA 8F 20 20 20 2F
0809:20 44 49 53 4B 20 50 41 55
0811:43 4B 41 47 45 20 20 20 3D
0819:20 20 20 20 00 3B 08 40 84
0821:FA 8F 20 20 28 43 29 20 59
0829:31 39 38 38 20 43 4F 4D A4
0831:50 55 54 45 21 20 20 20 87
0839:20 00 53 08 80 FA 9E C2 34
0841:28 34 33 29 AA C2 28 34 50
0849:34 29 AC 32 35 36 AA 38 86
0851:34 00 00 00 18 A5 2B 69 92
0859:79 85 5A A5 2C 69 09 85 CB
0861:5B A9 00 85 58 A9 C9 85 64
0869:59 A2 0A A0 9F 20 EC A3 15
0871:20 44 A6 20 00 C0 4C 86 9B
0879:E3 A2 02 BD 29 C0 95 7C 34
0881:CA 10 F8 A9 01 8D 56 02 A1
0889:A5 BA 8D 57 02 A9 2C A0 F1
0891:C0 85 A5 84 A6 A0 FF C8 E0
0899:B1 A5 20 16 E7 C9 00 D0 88
08A1:F6 60 4C 20 C1 0D 20 20 73
08A9:20 44 49 53 4B 20 50 41 F5
08B1:43 4B 41 47 45 3A 20 41 67
08B9:44 56 41 4E 43 45 44 20 66
08C1:44 4F 53 20 53 55 50 50 15
08C9:4F 52 54 20 0D 20 20 20 EB
08D1:20 20 20 20 20 20 20 20 E1
08D9:20 20 20 20 20 20 20 20 E9
08E1:20 20 20 20 20 20 20 20 F1
08E9:20 20 20 20 20 0D 0D 20 87
08F1:20 28 43 29 31 39 38 38 2E
08F9:20 43 4F 4D 50 55 54 45 6F
0901:21 20 50 55 42 4C 49 43 24
0909:41 54 49 4F 4E 53 2C 20 27
0911:49 4E 43 2E 0D 0D 00 20 63
0919:1E AB A9 3A 20 D2 FF A9 F3
0921:20 4C D2 FF 3D B2 25 2F DE
0929:AD 5E AE 5F 3B 2E 52 57 04
0931:4C 50 4E 3F 5A 58 40 3E 2E
0939:B1 24 23 55 45 51 46 57 3A
0941:21 00 D0 C3 D0 C3 D0 C3 35
0949:D0 C3 D0 C3 D0 C3 D0 C3 06
0951:43 C4 40 C3 91 C8 54 C7 9A
0959:54 C7 C3 C6 5B C6 45 C7 B4
0961:45 C8 C3 C6 A6 C5 EF C1 1B
0969:EF C1 EF C1 84 C2 88 C4 03
0971:A9 C4 A6 C5 E9 C4 F6 C4 CF
0979:0D C5 E1 FC 01 01 01 01 9E
0981:01 01 01 01 80 00 00 00 88
0989:00 00 00 00 00 00 80 80 1D
0991:80 80 80 80 01 01 80 80 A9
0999:80 85 A5 86 A6 BA BD 01 07
09A1:01 C9 E6 F0 04 C9 8C D0 C3
09A9:17 BD 02 01 C9 A7 F0 04 D9
09B1:C9 A4 D0 0C A5 A5 A2 15 CA
09B9:DD AB C0 F0 11 CA 10 F8 99
09C1:A5 A5 A6 A6 C9 3A B0 03 EA
09C9:4C 80 00 4C 8A 00 BD 03 B9
09D1:C1 30 05 CD 56 02 D0 E8 93
09D9:86 9B A5 A5 85 AB 20 82 C2
09E1:C1 A9 00 85 BB A9 02 85 A5
09E9:BC AD 57 02 85 BA A5 9B CE
09F1:0A AA BD CA C0 48 BD C9 84
09F9:C0 48 60 A0 00 20 73 00 FB
```

```
0A01:AA D0 03 4C DF C1 A9 60 7D
0A09:85 7C A5 7A 48 A5 7B 48 73
0A11:A5 AB C9 40 D0 09 8A C9 A9
0A19:2F D0 04 8D 00 02 C8 8A 76
0A21:C9 22 F0 1C 20 73 00 D0 22
0A29:F7 A0 00 68 85 7B 68 85 58
0A31:7A 20 79 00 C9 22 F0 0A 7C
0A39:A6 7B E0 02 D0 13 F0 07 77
0A41:68 68 20 73 00 F0 11 C9 8E
0A49:22 F0 0D 99 00 02 C8 10 8F
0A51:F1 A2 4C 86 7C 4C 23 C3 18
0A59:84 B7 A2 4C 86 7C 20 79 96
0A61:00 F0 05 20 73 00 D0 FB 8D
0A69:60 98 F0 67 A2 15 BD AB F8
0A71:C0 F0 1F CD 00 02 F0 03 CF
0A79:E8 10 F3 85 AB BD 03 C1 F8
0A81:30 05 CD 56 02 D0 0B 86 FD
0A89:9B C6 B7 A9 01 85 BB 4C 90
0A91:75 C1 20 4A C2 A9 00 85 BB
0A99:BB A9 02 85 BC 20 FC F3 E2
0AA1:AD 00 02 C9 2F F0 2C 4C 4B
0AA9:79 00 A9 60 85 B9 20 D5 DE
0AB1:F3 A5 BA 20 B4 FF A5 B9 2D
0AB9:20 96 FF A9 00 85 90 60 B5
0AC1:A0 64 2C A0 6F A5 BA 20 76
0AC9:B1 FF 98 85 B9 20 93 FF 97
0AD1:A0 00 60 A6 D6 20 FF E9 CD
0AD9:A9 23 20 16 E7 A6 BA A9 E9
0AE1:00 20 CD BD 20 A1 C0 A9 46
0AE9:6F 85 B9 20 38 C2 20 A5 03
0AF1:FF 20 16 E7 C9 0D D0 F6 6A
0AF9:20 AB FF 4C 79 00 E6 7A E1
0B01:D0 07 E6 7B A9 00 8D 51 8F
0B09:02 E6 B7 A0 4F B9 00 02 3E
0B11:99 01 02 88 10 F7 A9 24 D4
0B19:8D 00 02 20 D7 AA 20 31 13
0B21:C2 20 E2 C2 20 E2 C2 D0 0C
0B29:29 20 E2 C2 20 90 C3 20 4F
0B31:A5 FF A6 90 D0 1C 20 16 45
0B39:E7 C9 00 D0 F2 20 D7 AA 35
0B41:20 E1 FF F0 0D 20 E4 FF A1
0B49:C9 20 D0 D8 20 E4 FF 4C D4
0B51:D1 C2 20 42 F6 20 D7 AA BB
0B59:4C 79 00 20 A5 FF 85 A7 D5
0B61:20 A5 FF 85 A8 A6 90 60 AA
0B69:20 11 C3 30 1C 85 A9 20 B9
0B71:11 C3 10 0A C9 23 F0 04 64
0B79:C9 3E D0 1D A9 00 0A 85 D6
0B81:AA 0A 0A 65 AA 65 A9 85 CA
0B89:A9 60 88 B9 00 02 C9 30 05
0B91:90 07 C9 3A B0 03 29 0F 81
0B99:2C A2 80 60 A2 0B 2C A2 C0
0BA1:04 2C A2 05 2C A2 08 2C 91
0BA9:A2 09 AD 56 02 D0 03 4C 14
0BB1:29 C7 A9 FF 85 3A 8A 4C F9
0BB9:FB E0 20 4B C3 A5 90 30 C4
0BC1:E1 4C 79 00 A4 B7 F0 DD CE
0BC9:20 31 C2 20 E2 C2 D0 CF 2A
0BD1:A9 83 A0 C3 20 9E C0 20 0B
0BD9:9A C3 E6 A7 D0 02 E6 A8 8A
0BE1:20 A5 FF A4 90 F0 F3 A9 95
0BE9:89 A0 C3 20 9E C0 A5 A7 52
0BF1:D0 02 C6 A8 C6 A7 20 9A 04
0BF9:C3 4C D9 C2 53 54 41 52 2D
0C01:54 00 20 20 20 45 4E 44 40
0C09:00 A6 A7 A5 A8 20 CD BD 39
0C11:4C A6 C0 20 90 C3 A9 28 22
0C19:20 16 E7 A5 A8 20 B1 C3 0B
0C21:A5 A7 20 B1 C3 A9 29 4C 78
0C29:16 E7 48 4A 4A 4A 4A 20 24
0C31:BA C3 68 29 0F C9 0A 90 7B
0C39:03 69 36 2C 09 30 4C D2 2B
0C41:FF A5 AB C9 3D F0 02 C9 50
0C49:B2 60 20 53 C4 A6 2B A4 C7
0C51:2C 20 C8 C3 F0 07 C9 25 39
0C59:F0 03 A9 00 2C A9 01 85 6F
0C61:B9 20 C8 C3 D0 03 A9 01 9A
0C69:2C A9 00 20 D5 FF 08 AA 6D
0C71:20 50 C4 8A 28 B0 2C 20 6B
0C79:C8 C3 F0 32 C9 25 F0 3A 27
0C81:A5 AE 85 2D A5 AF 85 2E C0
0C89:20 59 A6 20 33 A5 A5 AB 06
0C91:C9 5E F0 04 C9 AE D0 22 51
0C99:A9 00 20 90 FF 20 8E A6 D7
0CA1:4C AE A7 20 C8 C3 D0 03 7C
0CA9:2C A2 1C 4C 39 C3 20 50 32
0CB1:C4 A5 90 29 10 D0 F2 20 04
0CB9:8D E1 4C 86 E3 20 53 C4 0E
0CC1:20 59 E1 20 D7 AA 20 5A 82
0CC9:C2 A9 2B 2C A9 2D 2C A9 D9
0CD1:00 85 A9 C9 2D D0 0A AD 8B
0CD9:11 D0 85 AA 29 EF 8D 11 3F
0CE1:D0 20 4A C2 A9 55 20 A8 6B
0CE9:FF A9 49 20 A8 FF A5 A9 D1
0CF1:20 A8 FF 20 AE FF A5 A9 B0
0CF9:C9 2B D0 05 A5 AA 8D 11 30
0D01:D0 60 A4 B7 C8 20 EF C2 15
0D09:30 10 A5 A9 C9 04 90 0A 18
0D11:C9 1F B0 06 8D 57 02 4C 68
0D19:79 00 A5 AB C9 23 D0 34 10
0D21:4C 2F C3 AD 01 02 C9 30 54
0D29:D0 2A AD 02 02 C9 3E D0 90
0D31:23 20 89 C4 AE 57 02 A0 D9
0D39:08 84 B7 88 8A 09 40 99 8A
0D41:00 02 88 8A 09 20 D0 03 03
0D49:B9 E4 C4 99 00 02 88 10 D4
0D51:F7 4C 66 C5 A9 00 85 BB B7
0D59:E6 B7 4C 19 C2 4D 2D 57 EC
0D61:77 00 02 A2 02 BD AB E3 E3
0D69:95 7C CA 10 F8 4C 86 E3 B1
0D71:38 A5 33 E5 31 AA A5 34 89
0D79:E5 32 20 CD BD A9 60 A0 E9
0D81:E4 20 18 C0 4C 79 00 AD 1B
0D89:01 02 C9 50 D0 51 AD 02 0C
0D91:02 C9 2B F0 04 C9 2D D0 06
0D99:46 85 AB 20 56 C4 A9 6F 38
0DA1:85 B9 20 38 C2 A8 20 A5 13
0DA9:FF 24 90 D0 38 D9 7A C5 CF
0DB1:D0 33 C8 C0 14 D0 EF 20 0A
0DB9:AB FF A0 19 84 B7 88 B9 1D
0DC1:8E C5 99 00 02 88 10 F7 12
0DC9:A5 AB C9 2D F0 05 A9 FF 9C
0DD1:8D 0A 02 20 19 C2 A9 45 E3
0DD9:8D 02 02 A0 05 84 B7 20 4F
0DE1:19 C2 6C 02 03 20 AB FF D6
0DE9:AD 11 D0 85 AA 20 50 C4 CC
0DF1:4C 2F C3 37 33 2C 43 42 FC
0DF9:4D 20 44 4F 53 20 56 32 3A
0E01:2E 36 20 31 35 34 31 4D 03
0E09:2D 57 06 02 13 20 42 D0 E0
0E11:A9 41 8D 02 07 A9 41 8D 13
0E19:01 01 20 07 EF 6C 65 00 66
0E21:AD 56 02 D0 1E EE 56 02 52
0E29:AD 54 02 8D 02 03 AD 55 17
0E31:02 8D 03 03 AD 52 02 8D 8A
0E39:00 03 AD 53 02 8D 01 03 4C
0E41:4C 86 E3 A5 31 A4 32 C8 45
0E49:20 08 A4 A9 00 8D 56 02 8B
0E51:AD 02 03 8D 54 02 AD 03 07
0E59:03 8D 55 02 A9 16 8D 02 E7
0E61:03 A9 C6 8D 03 03 AD 00 9A
0E69:03 8D 52 02 AD 01 03 8D D9
0E71:53 02 A9 08 8D 00 03 A9 89
0E79:C6 8D 01 03 A9 00 8D 95 AA
0E81:02 A9 35 A0 C6 20 18 C0 61
0E89:A9 53 A0 C0 20 18 C0 20 72
0E91:60 A5 86 7A 84 7B 20 73 85
0E99:00 F0 F4 20 3B C1 24 BE 7A
0EA1:10 09 A9 07 20 16 E7 A9 80
0EA9:00 85 BE 6C 02 03 0D 20 1C
0EB1:20 44 49 53 4B 20 50 41 0A
0EB9:43 4B 41 47 45 20 2D 2D 19
0EC1:20 44 49 53 4B 20 45 44 07
0EC9:49 54 49 4E 47 20 53 59 68
0ED1:53 54 45 4D 00 A4 B7 C0 EC
0ED9:04 F0 0F C0 07 F0 0B C0 F4
0EE1:02 F0 07 C0 01 F0 04 4C 48
0EE9:23 C3 88 88 84 9B F0 06 9C
0EF1:AD 01 02 20 1E C7 20 CC 84
0EF9:FF A9 00 20 BD FF AD 00 CB
0F01:02 C9 33 90 E2 C9 38 B0 61
0F09:DE 29 0F AA A9 0E A0 00 34
0F11:20 BA FF 20 C0 FF A2 0E 49
0F19:20 C9 FF B0 10 A4 9B 84 93
0F21:B7 D0 0D AD 01 02 C9 3F AE
0F29:D0 44 4C 46 C8 4C 29 C7 40
0F31:A0 00 B9 02 02 99 00 02 6F
0F39:C8 C4 B7 90 F5 A4 B7 F0 8F
0F41:2D C0 05 F0 04 C0 02 D0 CD
0F49:9E 20 35 C7 85 A8 C0 03 35
0F51:F0 0C A5 A8 85 A7 18 69 8E
0F59:07 85 A8 4C DC C8 20 1A 9A
0F61:C7 20 35 C7 85 A7 A5 A8 4D
0F69:C5 A7 90 33 B0 08 A9 00 92
0F71:85 A7 A9 FF 85 A8 4C DC B5
0F79:C8 88 B9 00 02 C9 30 90 7D
0F81:1E C9 47 B0 1A C9 3A 90 12
0F89:07 C9 41 90 12 18 69 09 9B
0F91:29 0F 60 88 B9 00 02 C9 38
0F99:2C F0 F7 C9 20 F0 F3 4C 9E
0FA1:23 C3 A9 80 85 BE A9 0E 08
0FA9:20 C3 FF 4C CC FF 20 00 34
0FB1:C7 85 AA 20 00 C7 0A 0A A9
0FB9:0A 0A 05 AA 85 AA 60 A0 E2
0FC1:00 84 B7 B1 31 8D 95 02 FF
0FC9:C8 B1 31 8D 96 02 A4 B7 75
0FD1:D0 12 A5 AB C9 57 F0 C7 A1
0FD9:AD 96 02 85 A8 AD 95 02 36
0FE1:85 A7 D0 11 C0 05 D0 B7 4B
0FE9:20 35 C7 85 A8 20 1A C7 78
0FF1:20 35 C7 85 A7 A5 A7 F0 D2
0FF9:A6 8D 95 02 A5 A8 8D 96 23
1001:02 A0 0C 84 B7 A0 0A B9 22
1009:34 C8 99 00 02 88 10 F7 F2
1011:38 A5 A8 EE 0A 02 E9 0A F0
1019:10 F9 69 0A 09 30 8D 0B BC
1021:02 CE 0A 02 38 A5 A7 EE ED
1029:07 02 E9 0A 10 F9 69 0A 70
1031:09 30 8D 08 02 CE 07 02 6F
1039:A9 C1 85 BB A9 C0 85 BC 23
1041:A9 01 85 B7 A9 64 85 B9 46
1049:20 D5 F3 A0 0C 84 B7 A5 FE
1051:AB C9 57 D0 2C 20 4A C2 EA
1059:B9 3F C8 20 A8 FF C8 C0 D8
1061:07 D0 F5 20 AE FF EE 01 4E
1069:02 20 47 C2 B1 31 20 A8 E2
1071:FF C8 D0 F8 20 19 C2 A9 02
1079:64 85 B9 20 42 F6 4C 5A 47
1081:C2 20 19 C2 A9 64 85 B9 FD
1089:20 38 C2 A8 20 A5 FF 91 D3
1091:31 C8 D0 F8 20 42 F6 AD CB
1099:56 02 09 40 8D 56 02 A9 FD
10A1:00 85 A7 A9 7F 85 A8 20 36
10A9:D7 AA 4C DC C8 55 31 20 D5
10B1:34 20 30 20 30 30 20 30 AE
10B9:42 2D 50 20 34 20 30 AD 82
10C1:95 02 F0 20 A9 75 A0 C8 7A
10C9:20 9E C0 AD 95 02 20 B1 3B
10D1:C3 A9 7B A0 C8 20 9E C0 7C
10D9:AD 96 02 20 B1 C3 20 D7 6D
10E1:AA 4C 7F C9 A9 84 A0 C8 60
10E9:20 18 C0 4C 2D C7 54 52 80
10F1:41 43 4B 00 20 20 53 45 5A
10F9:43 54 4F 52 00 4E 4F 4E 06
1101:45 20 52 45 41 44 0D 00 A1
1109:4C 23 C3 A4 B7 C0 1B 90 64
1111:F7 A0 02 B9 00 02 C9 3A 09
1119:F0 03 20 1E C7 20 35 C7 4B
1121:85 A9 A2 23 A0 1B 20 35 DD
1129:C7 9D 00 02 CA 20 1A C7 89
1131:C0 03 D0 F2 A4 A9 E8 BD 19
1139:00 02 91 31 C8 E0 23 D0 02
1141:F5 A9 91 20 16 E7 A6 D5 70
1149:E0 4F D0 03 20 16 E7 A5 C8
1151:A9 85 A7 85 A8 A9 2E 20 5F
1159:D2 FF A5 A7 A8 18 69 08 94
1161:85 A6 98 20 B1 C3 20 A1 83
1169:C0 A5 AB C9 5A D0 13 C4 68
1171:A8 F0 02 B0 0D A5 A6 C9 85
1179:08 B0 03 98 10 04 A9 00 99
1181:91 31 B1 31 20 B1 C3 20 71
1189:A6 C0 C8 C4 A6 D0 DA 20 E2
1191:A6 C0 A4 A7 E6 C7 B1 31 31
1199:F0 0B C9 20 B0 0C C9 0D 88
11A1:D0 06 A9 5F 2C A9 40 2C 8D
11A9:A9 2E C9 22 D0 02 A9 27 90
11B1:C9 80 90 14 C9 A0 90 0E 2C
11B9:C9 C0 90 0C A2 00 86 C7 AD
11C1:C9 E0 B0 04 29 BF 49 C0 F2
11C9:20 D2 FF C8 C4 A6 D0 C4 64
11D1:20 D7 AA 20 E1 FF F0 20 62
11D9:A5 A6 C9 08 90 1A 85 A7 D1
11E1:C5 A8 90 28 F0 26 2C 56 74
11E9:02 50 15 A5 9A C9 03 D0 F0
11F1:07 A9 96 A0 C9 20 18 C0 9E
```

```
11F9:AD 56 02 29 BF 8D 56 02 3E
1201:A5 9A C9 03 F0 03 20 D7 B3
1209:AA 4C 2D C7 4C DC C8 4C 6B
1211:38 30 2C 46 46 91 0D 00 D9
```

Program 2: 1764 Interface

```
0801:1E 08 00 FA 8F 20 20 31 40
0809:37 36 34 20 49 4E 54 45 3C
0811:52 46 41 43 45 20 20 20 43
0819:20 20 20 20 00 3B 08 40 84
0821:FA 8F 20 28 43 29 20 31 49
0829:39 38 38 20 43 4F 4D 50 2F
0831:55 54 45 21 20 20 20 20 9D
0839:20 00 53 08 80 FA 9E C2 34
0841:28 34 33 29 AA C2 28 34 50
0849:34 29 AC 32 35 36 AA 38 86
0851:34 00 00 00 18 A5 2B 69 92
0859:7C 85 5A A5 2C 69 02 85 3F
0861:5B A9 00 85 58 A9 CE 85 6E
0869:59 A2 03 A0 E1 20 EC A3 46
0871:20 D7 AA 20 00 CC 20 44 96
0879:A6 4C 86 E3 A5 7E C9 C1 7B
0881:F0 20 C9 97 F0 19 A9 14 18
0889:A0 CC 20 1E AB 4C 65 A4 01
0891:0D 3F 49 4E 53 54 41 4C C0
0899:4C 41 54 49 4F 4E 00 A9 9C
08A1:00 2C A9 80 8D 85 02 A9 2A
08A9:99 85 7D A9 CC 85 7E A9 55
08B1:3A A0 CC 4C 1E AB 0D 20 3F
08B9:20 20 20 20 2A 2A 2A 20 56
08C1:31 37 36 34 20 4D 4F 44 5B
08C9:55 4C 45 20 49 4E 53 54 C0
08D1:41 4C 4C 45 44 20 2A 2A 94
08D9:2A 0D 00 3B 5F 40 3E B1 20
08E1:24 46 23 51 45 55 57 21 5E
08E9:00 36 CE 8E CD 50 CD 50 E5
08F1:CD 50 CD D4 CD 43 CD D5 F0
08F9:CE 43 CD 93 CE A0 CE 93 5F
0901:CE E2 FC 80 01 80 80 80 66
0909:80 80 80 01 01 80 80 80 27
0911:A9 20 4C D2 FF 85 A5 86 9E
0919:A6 BA BD 01 01 C9 E6 F0 E2
0921:04 C9 8C D0 29 BD 02 01 8B
0929:C9 A7 F0 04 C9 A4 D0 1E 09
0931:20 0D CD B0 0B 2C 85 02 71
0939:30 03 4C 3B 97 4C 3B C1 87
0941:A5 A5 A2 05 DD 5F CC F0 2B
0949:13 CA 10 F8 30 E7 A5 A5 3B
0951:A6 A6 C9 3A B0 03 4C 80 E7
0959:00 4C 8A 00 BD 87 CC 30 A5
0961:05 CD 56 02 D0 E8 86 9B 27
0969:A5 A5 85 AB 20 39 CD A9 4E
0971:00 85 BB A9 02 85 BC AD 44
0979:57 02 85 BA A5 9B 0A AA 6E
0981:BD 6E CC 48 BD 6D CC 48 B1
0989:60 A2 02 BD 01 CF DD 26 B9
0991:CD D0 0D CA 10 F5 AD 04 C4
0999:CF CD 57 02 D0 02 38 60 71
09A1:18 60 A5 99 C9 A9 04 AE D1
09A9:57 02 4C BA FF 20 C0 FF 1F
09B1:A2 04 4C C6 FF 2C 85 02 C9
09B9:30 03 4C 82 97 4C 82 C1 0B
09C1:E6 B7 2C 85 02 30 03 4C 36
09C9:F0 97 4C F0 C1 98 F0 46 6B
09D1:A2 05 BD 5F CC F0 1F CD 5A
09D9:00 02 F0 03 E8 10 F3 85 AF
09E1:AB BD 87 CC 30 05 CD 56 7E
09E9:02 D0 0B 86 9B C6 B7 A9 0C
09F1:01 85 BB 4C 00 CD A0 0F A9
09F9:20 29 CD 20 C0 FF 20 CA 33
0A01:CD AD 00 02 C9 2F F0 0E 82
0A09:4C 79 00 A0 01 20 29 CD 54
0A11:20 59 E1 20 D7 AA A6 D6 57
0A19:20 FF E9 A9 23 20 16 E7 C2
0A21:AE 57 02 A9 00 20 CD BD 17
0A29:A9 3A 20 16 E7 20 94 CC BB
0A31:A0 0F 20 29 CD A9 00 85 8A
0A39:B7 20 31 CD 20 31 CE 20 B7
0A41:16 E7 C9 0D D0 F6 20 CC D3
0A49:FF A9 04 20 C3 FF 4C 79 7A
0A51:00 E6 7A D0 07 E6 7B A9 EF
0A59:00 8D 51 02 E6 B7 A0 4F C1
0A61:B9 00 02 99 01 02 88 10 5D
0A69:F7 A9 24 8D 00 02 A0 00 8A
0A71:20 29 CD 20 31 CD B0 CE 8C
0A79:20 2B CE D0 C9 20 D7 AA 78
0A81:20 26 CE D0 17 20 CD BD A8
0A89:20 94 CC 20 31 CE D0 0C E0
0A91:20 16 E7 C9 00 D0 F4 20 22
0A99:E1 FF D0 E1 20 D7 AA 4C D8
0AA1:CA CD 20 2B CE D0 0B 20 35
0AA9:31 CE D0 06 AA 20 CF FF F9
0AB1:A4 90 60 A4 B7 F0 56 A0 61
0AB9:00 20 29 CD 20 31 CD 20 59
0AC1:2B CE D0 41 86 A7 85 A8 D3
0AC9:A9 76 A0 CE 20 1E AB A6 C8
0AD1:A7 A5 A8 20 7E CE E6 A7 DE
0AD9:D0 02 E6 A8 20 31 CE F0 92
0AE1:F5 20 6B CE 4C CA CD 2C A8
0AE9:85 02 30 03 4C 6E 99 4C 13
0AF1:6E C3 53 54 41 52 54 3A 14
0AF9:20 00 2C 85 02 30 03 4C 1F
0B01:9A 99 4C 9A C3 A9 04 20 EA
0B09:C3 FF A2 04 2C A2 08 2C BD
0B11:A2 09 2C 85 02 30 03 4C BB
0B19:31 99 4C 31 C3 AD 01 02 A3
0B21:C9 30 D0 25 AD 02 02 C9 D7
0B29:3E D0 1E 20 D6 CE AD 57 FC
0B31:02 8D 03 02 A5 BA 8D 57 B6
0B39:02 A0 03 84 B7 20 CD CE C9
0B41:AD 04 CF 8D 57 02 6C 02 9F
0B49:03 A9 00 85 BB E6 B7 4C D8
0B51:7A CD 2C 85 02 30 03 4C 19
0B59:89 9A 4C 89 C4 00 00 00 23
```

BEFORE TYPING . . .

Before typing in programs, please refer to "How to Type In COMPUTE!'s GAZETTE Programs," elsewhere in this issue.

The *GEOS* Column

See instructions in article on page 47 before typing in.

Program 1: Quick Clock

```
5A00:BF FF FF FF 80 00 01 98 33
5A08:92 49 A4 92 51 A4 92 61 B9
5A10:AC 92 51 9C F2 49 82 00 75
5A18:01 81 FF 01 82 10 81 84 99
5A20:90 41 88 00 21 92 21 11 25
5A28:90 20 11 96 3D 91 90 00 0A
5A30:11 92 01 11 88 00 21 98 62
5A38:92 31 BC 10 F9 FF FF FF EA
5A40:83 05 00 FC 5A C7 5D FC 71
5A48:5A D1 55 49 43 4B C3 4C F8
5A50:4F 43 4B 20 20 20 20 20 CA
5A58:20 00 00 00 00 C5 52 4E 27
5A60:45 53 54 20 D2 2E 20 C8 71
5A68:55 4E 54 45 52 00 00 00 CC
5A70:00 00 00 00 00 00 00 00 25
5A78:00 00 00 00 00 00 00 00 2D
5A80:00 00 00 00 00 00 00 00 35
5A88:00 00 00 00 00 00 00 00 3D
5A90:00 00 00 00 00 00 00 00 45
5A98:00 00 00 00 00 00 00 00 4D
5AA0:00 00 00 00 00 00 00 00 55
5AA8:00 00 00 00 00 00 00 00 5D
5AB0:00 00 00 00 00 00 00 00 65
5AB8:00 00 00 00 00 00 00 00 6D
5AC0:00 00 00 00 00 00 00 00 75
5AC8:00 00 00 00 00 00 00 00 7D
5AD0:00 00 00 00 00 00 00 00 85
5AD8:00 00 00 00 00 00 00 00 8D
5AE0:00 00 00 00 00 00 00 00 95
5AE8:00 00 00 00 00 00 00 00 9D
5AF0:00 00 00 00 00 00 00 00 A5
5AF8:00 00 00 00 4C 64 5B 4C A4
5B00:02 5B 20 01 5C 20 86 FE 12
5B08:20 86 FE A0 00 B9 6F 5E 7E
5B10:99 06 00 C8 C0 06 D0 F5 57
5B18:20 B3 C2 C9 00 D0 03 4C 56
5B20:35 5B A9 1B 20 45 C1 A2 6B
5B28:00 20 0C C1 20 12 C1 20 71
5B30:3E C2 4C C3 C1 A0 00 B9 C6
5B38:75 5E 99 06 00 C8 C0 06 7F
5B40:D0 F5 20 B3 C2 C9 00 F0 4A
5B48:03 4C 18 5D A0 00 B9 7B 60
5B50:5E 99 06 00 C8 C0 06 D0 83
5B58:F5 20 B3 C2 C9 00 F0 03 E7
5B60:4C DB 5C 60 20 9B 5B 20 0C
5B68:01 5C A2 02 8E 8D 5E A2 35
5B70:5B 8E 8E 5E A2 8D 86 02 8A
5B78:A2 5E 86 03 A9 01 20 03 AD
5B80:C1 A2 00 20 06 C1 A2 00 3F
5B88:20 09 C1 20 8A C1 A2 8C F8
5B90:86 3C A2 32 86 3A A2 01 74
5B98:86 3B 60 20 4B C1 A2 00 16
5BA0:8E AB 84 A2 00 86 33 A2 67
5BA8:C6 86 34 A2 00 86 35 A2 3C
5BB0:00 86 36 A2 3C 86 37 A2 07
5BB8:01 86 38 20 C2 5B 20 DB 3A
5BC0:5B 60 A9 80 85 2F 20 A8 4C
5BC8:C1 05 00 01 B1 00 8E 03 5F
5BD0:3B 01 A3 05 02 07 B1 00 B9
5BD8:8E 00 60 20 A8 C1 05 FF 3B
5BE0:06 B2 00 95 1B 18 C4 41 A4
5BE8:54 45 20 20 20 20 20 20 03
5BF0:20 D4 49 4D 45 20 20 20 F5
5BF8:12 D1 D5 C9 D4 13 1A 00 AB
5C00:60 A9 80 85 2F A0 A0 84 7D
5C08:05 A0 B2 84 18 A0 00 84 D1
5C10:19 A9 1A 20 45 C1 20 9E 15
5C18:5C AC 17 85 20 A3 5C A9 57
5C20:2F 20 45 C1 20 9E 5C AC 1E
5C28:18 85 20 A3 5C A9 2F 20 94
5C30:45 C1 20 9E 5C AC 16 85 31
5C38:20 A3 5C A9 20 20 45 C1 DD
5C40:A9 20 20 45 C1 AC 19 85 A6
5C48:C0 0A B0 05 A9 30 20 45 DD
5C50:C1 20 9E 5C AC 19 85 20 80
5C58:A3 5C A9 3A 20 45 C1 AC 19
5C60:1A 85 C0 0A B0 05 A9 30 5D
5C68:20 45 C1 20 9E 5C AC 1A 96
5C70:85 20 A3 5C A9 1B 20 45 6D
5C78:C1 A9 18 20 45 C1 A9 3A 40
5C80:20 45 C1 AC 1B 85 C0 0A 18
5C88:B0 05 A9 30 20 45 C1 20 CC
5C90:9E 5C AC 1B 85 20 A3 5C 47
5C98:A9 20 20 45 C1 60 A0 00 57
5CA0:84 03 60 84 02 A9 C0 20 09
5CA8:84 C1 60 A0 00 A9 00 99 6A
5CB0:81 5E C8 C0 08 D0 F6 A2 FA
5CB8:81 86 02 A2 5E 86 03 A2 F3
5CC0:00 86 04 A2 99 86 05 A2 59
5CC8:08 86 06 A2 B2 86 18 A2 94
5CD0:00 86 19 86 0A 86 0B 20 57
5CD8:BA C1 60 A2 00 20 0C C1 EF
5CE0:20 12 C1 20 C2 5B 20 A8 D4
5CE8:C1 05 FF 06 B2 00 95 1B FF
5CF0:18 C5 4E 54 45 52 20 44 2E
5CF8:41 54 45 20 28 4D 4D 2F 52
5D00:44 44 2F 59 59 29 12 13 10
5D08:1A 00 A2 F5 8E A3 84 A2 32
5D10:5D 8E A4 84 20 AB 5C 60 C2
5D18:A2 00 20 0C C1 20 12 C1 5D
5D20:20 C2 5B 20 A8 C1 05 FF 5F
5D28:06 B2 00 95 1B 18 C5 4E FE
5D30:54 45 52 20 54 49 4D 45 5A
5D38:20 28 48 48 3A 4D 4D 3A 76
5D40:53 53 29 12 13 1A 00 A2 63
5D48:55 8E A3 84 A2 5D 8E A4 5A
5D50:84 20 AB 5C 60 A5 01 48 74
5D58:A9 35 85 01 AD 0F DC 29 82
5D60:7F 8D 0F DC A0 00 8C 62 6E
5D68:5E B9 81 5E AA C9 30 F0 A4
5D70:32 C9 32 D0 19 A0 01 B9 11
5D78:81 5E 38 E9 30 A8 B9 65 2E
5D80:5E AA B9 6A 5E A8 A9 01 DC
5D88:8D 62 5E 4C A9 5D A0 01 38
5D90:B9 81 5E A8 C9 32 90 11 28
5D98:A9 01 8D 62 5E CA 88 88 F7
5DA0:4C A9 5D A0 01 B9 81 5E F1
5DA8:A8 20 4F 5E 8D 0B DC AD 8F
```

```
5DB0:62 5E C9 01 D0 08 AD 0B 8A
5DB8:DC 09 80 8D 0B DC A0 03 1D
5DC0:B9 81 5E AA A0 04 B9 81 39
5DC8:5E A8 20 4F 5E 8D 0A DC EF
5DD0:A0 06 B9 81 5E AA A0 07 92
5DD8:B9 81 5E A8 20 4F 5E 8D AF
5DE0:09 DC A9 00 8D 08 DC AD 80
5DE8:0F DC 09 01 8D 0F DC 68 5E
5DF0:85 01 4C 64 5B A0 00 B9 95
5DF8:81 5E AA A0 01 B9 81 5E BB
5E00:A8 20 2E 5E 8D 17 85 A0 39
5E08:03 B9 81 5E AA A0 04 B9 64
5E10:81 5E A8 20 2E 5E 8D 18 5A
5E18:85 A0 06 B9 81 5E AA A0 97
5E20:07 B9 81 5E A8 20 2E 5E 65
5E28:8D 16 85 4C 64 5B 8A 38 84
5E30:E9 30 8D 63 5E A9 00 A2 12
5E38:0A 18 6D 63 5E CA D0 F9 9D
5E40:8D 63 5E 98 38 E9 30 18 D3
5E48:6D 63 5E 8D 63 5E 60 8A 19
5E50:38 E9 30 0A 0A 0A 0A 8D 64
5E58:64 5E 98 38 E9 30 0D 64 04
5E60:5E 60 00 00 00 30 30 31 B6
5E68:31 31 38 39 30 31 32 8F DE
5E70:98 18 01 2A 01 8F 98 F1 AB
5E78:00 04 01 8F 98 B2 00 C4 A3
5E80:00 00 00 00 00 00 00 00 3D
5E88:00 00 00 00 00 63 63 1E B7
5E90:00 4C 2C C2 00 00 00 00 12
```

Program 2: GeoConverter

```
HE 10 REM COPYRIGHT 1988 COMPU
      TE! PUBLICATIONS, INC. -
       ALL RIGHTS RESERVED
PR 20 POKE 53280,0:POKE 53281,
      0:POKE 646,5:PRINTCHR$(1
      42);CHR$(147)
SX 30 FORI=1TO10:PRINT"{DOWN}"
      :NEXT
JJ 40 PRINTTAB(5)"{4}UDI COPYR
      IGHT 1988"
DJ 50 PRINTTAB(5)"GCH COMPUTE!
       PUBLICATIONS INC."
FJ 60 PRINTTAB(5)"JFK ALL RIGH
      TS RESERVED{HOME}"
XP 70 PRINT"{DOWN}{RVS}{8}GEOC
      ONVERTER 1.1{OFF}{DOWN}
      {GRN}"
FM 80 INPUT"FILE TO CONVERT";G
      F$
PS 90 PRINT"{DOWN}SEARCHING FO
      R "GF$
HA 100 HD$="":FOR I=1 TO 4:REA
       D HE:HD$=HD$+CHR$(HE):N
       EXT
KK 110 FOR I=1TO5:READIE:ID$=I
       D$+CHR$(IE):NEXT
MD 120 NL$="":T$=CHR$(18):S$=C
       HR$(1):OPEN 15,8,15,"I0
       :":OPEN 2,8,2,"#"
CR 130 GOSUB360:GET #2,NT$,NS$
FB 140 FOR E=0 TO 7
JX 150 D$=NL$:GET#2,B$:I=1:IFB
       $=NL$ THEN210
HR 160 IF ASC(B$)<>130 THEN210
PM 170 GET#2,HT$,HS$:I=3:IF HS
       $="" THEN HS$=CHR$(0)
BG 180 GET#2,B$:I=I+1:IF B$=""
        THEN B$=CHR$(0)
GH 190 IF ASC(B$)=160 THEN210
BR 200 D$=D$+B$:GOTO180
BK 210 FOR I=I TO 31:GET#2,B$:
       NEXT
FK 220 IF D$=GF$ THEN250
AA 230 NEXT E:IF NT$=NL$ THEN2
       50
GR 240 T$=NT$:S$=NS$:GOTO130
JS 250 IF D$=NL$ THENPRINT"
       {DOWN}{RVS}FILE NOT FOU
       ND{OFF}":GOTO350
GJ 260 PRINT"{DOWN}CONVERTING
       {SPACE}"GF$
JR 270 DT$=T$:DS$=S$:T$=HT$:SS
       =HS$:GOSUB360
SA 280 GET#2,MT$,MS$:IF MS$=""
        THEN MS$=CHR$(0)
JM 290 FOR I=0 TO 65:GET #2,BS
       :NEXT
XA 300 GET#2,CT$,GT$:GOSUB360:
       PRINT#2,HD$;:GOSUB370:T
       $=DT$:S$=DS$:GOSUB360
KP 310 FOR I=0 TO 32*E+2:GET#2
       ,B$:NEXT
KQ 320 PRINT#2,MT$;MS$;:FORI=0
        TO 15:GET#2,B$:NEXT
MQ 330 PRINT#2,HT$;HS$;CHR$(0)
       ;GT$;
QJ 340 PRINT#2,ID$;:GOSUB370:P
       RINT:PRINTGF$" CONVERTE
       D"
AS 350 CLOSE2:CLOSE15:END
QC 360 U$="U1":GOTO380
KQ 370 U$="U2"
QE 380 PRINT#15,U$;2;0;ASC(T$+
       "0");ASC(S$+"0")
PX 390 RETURN
BP 400 DATA 0,255,3,21,87,10,1
       ,0,0
```

BEFORE TYPING . . .

Before typing in programs, please refer to "How to Type In COMPUTE!'s GAZETTE Programs," elsewhere in this issue.

ML Boot

See instructions in article on page 59 before typing in.

Program 1: ML Boot—Part 1

```
02A7:A9 08 A2 08 A0 FF 20 BA 57
02AF:FF A2 CF A0 02 A9 0B 20 4D
02B7:BD FF A2 01 A0 08 A9 00 77
02BF:20 D5 FF A9 83 8D 02 03 3D
02C7:A9 A4 8D 03 03 4C 01 08 FE
02CF:47 45 4E 42 4F 4F 54 2E 45
02D7:45 58 45 00 00 00 00 00 3D
02DF:00 00 00 00 00 00 00 00 E3
02E7:00 00 00 00 00 00 00 00 EB
02EF:00 00 00 00 00 00 00 00 F3
02F7:00 00 00 00 00 00 00 00 FB
02FF:00 8B E3 A7 02 00 00 00 ED
```

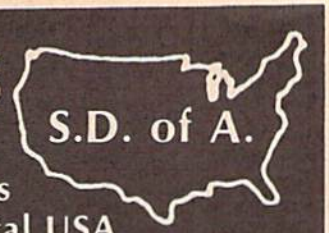
Program 2: ML Boot—Part 2

```
0801:20 2D 08 20 6F 08 20 E7 33
0809:08 A9 5F 8D 57 0A A9 0A 8C
0811:8D 58 0A 20 1B 09 CE 54 30
0819:0A D0 F8 A9 5F 85 FB A9 CE
0821:0A 85 FC 20 4C 09 20 6F 6F
0829:09 4C 42 A6 A9 05 8D 86 86
0831:02 8D 21 D0 8D 20 D0 A9 0F
0839:93 20 D2 FF A9 00 20 18 1B
0841:FE A2 00 A9 72 85 FB A9 5F
0849:05 85 FC A9 72 85 FD A9 C6
0851:D9 85 FE A0 00 B9 0E 0A A6
0859:F0 0B 29 BF 91 FB 8A 91 E8
0861:FD C8 4C 56 08 AD 18 D0 89
0869:09 02 8D 18 D0 60 A9 05 12
0871:A2 08 A0 05 20 BA FF A9 CE
0879:08 A2 20 A0 0A 20 BD FF 90
0881:20 C0 FF A2 05 20 C6 FF 32
0889:20 CF FF 8D 5D 0A 20 CF 99
0891:FF 8D 5C 0A 20 CF FF 8D FE
0899:5E 0A 20 CF FF 8D 54 0A 45
08A1:8D 55 0A 60 A9 0F A2 08 EB
08A9:A0 0F 20 BA FF A9 00 20 44
08B1:BD FF 20 C0 FF A2 0F 20 79
08B9:C6 FF 20 CF FF 8D 5B 0A 25
08C1:AD 5B 0A C9 14 B0 01 60 23
08C9:20 4C 09 A9 50 A0 0A 20 F1
08D1:1E AB AE 5B 0A A9 00 20 7E
08D9:CD BD A9 0D 20 D2 FF 20 B2
08E1:D2 FF 4C D9 09 60 A2 05 96
08E9:20 C6 FF A2 00 20 CF FF 06
08F1:9D 5F 0A E8 20 CF FF 9D 56
08F9:5F 0A A0 00 E8 20 CF FF B7
0901:9D 5F 0A E8 C8 C0 10 90 83
0909:F4 CE 54 0A D0 DF AD 55 2B
0911:0A 8D 54 0A A9 05 20 C3 1C
0919:FF 60 A9 08 A2 08 A0 01 70
0921:20 BA FF 20 9D 09 A9 10 68
0929:20 BD FF A9 00 20 D5 FF 81
0931:A9 12 18 6D 57 0A 90 03 7D
0939:EE 58 0A 8D 57 0A 60 A9 40
0941:12 18 65 FB 90 02 E6 FC 26
0949:85 FB 60 AD 5D 0A 8D 20 52
0951:D0 AD 5E 0A 8D 86 02 AD DB
0959:5C 0A 8D 21 D0 A9 40 20 AD
0961:18 FE 20 E9 09 A9 0F 20 0F
0969:C3 FF 4C 42 A6 60 A2 00 07
0971:8E 5A 0A AE 5A 0A BD A7 AB
0979:02 8D 92 09 E8 BD A7 02 62
0981:D0 07 E8 8E 5A 0A 4C 94 EB
0989:09 8D 93 09 E8 8E 5A 0A C6
0991:20 00 00 CE 55 0A F0 03 58
0999:4C 74 09 60 AE 57 0A AC A9
09A1:58 0A 86 FB 84 FC A0 00 4C
09A9:B1 FB AE 59 0A 9D A7 02 17
09B1:E8 C8 B1 FB 9D A7 02 E8 D8
09B9:8E 59 0A AE 57 0A AC 58 2A
09C1:0A E8 D0 01 C8 E8 D0 01 C9
09C9:C8 60 A0 10 A9 00 91 FB D9
09D1:A6 FB A4 FC 20 1E AB 60 CB
09D9:A9 29 A0 0A 20 1E AB A5 36
09E1:C6 F0 FC A9 00 85 C6 60 D1
09E9:AE 5C 0A A9 72 85 FB A9 91
09F1:05 85 FC A9 72 85 FD A9 71
09F9:D9 85 FE A0 00 A9 20 91 BC
0A01:FB 8A 91 FD C8 C0 11 F0 24
0A09:03 4C FE 09 60 42 4F 4F 1C
0A11:54 49 4E 47 20 53 59 53 34
0A19:54 45 4D 2E 2E 2E 00 42 A1
0A21:4F 4F 54 2E 44 41 54 00 ED
0A29:11 11 1D 1D 12 1E D0 52 7C
0A31:45 53 53 20 41 4E 59 20 3F
0A39:4B 45 59 20 54 4F 20 43 D4
0A41:4F 4E 54 49 4E 55 45 2E 30
0A49:2E 2E 92 11 11 9A 00 80 D6
0A51:D4 60 00 00 00 00 00 00 E7
0A59:00 00 00 00 00 00 00 00 6D
```

Program 3: ML Boot—BOOT .DAT Creator

```
HE 10 REM COPYRIGHT 1988 COMPU
      TE! PUBLICATIONS, INC. -
       ALL RIGHTS RESERVED
RH 20 DIMFD$(9),CV$(15,1)
EG 30 POKE53280,0:POKE53281,0
PR 40 FORI=0TO15:CV$(I,0)=CHR$
      (48+I):CV$(I,1)=STR$(I)
HK 50 IFI>9THENCV$(I,0)=CHR$(5
      5+I)
HH 60 NEXTI
GM 70 CF=0:PRINT"{CLR}"CHR$(14
      )CHR$(8)"{3 SPACES}COPYR
      IGHT 1988 COMPUTE! PUB.,
      INC."
BH 80 PRINTTAB(11)"ALL RIGHTS
      {SPACE}RESERVED"
EF 90 PRINT"{2 DOWN}{RED}{RVS}
      BUILD DATA FILE FOR MULT
      I-BOOT...{OFF}{GRN}"
AE 100 INPUT"{2 DOWN}{RVS}B
       {OFF}UILD OR {RVS}V
       {OFF}IEW DATA FILE
       {3 RIGHT}V{3 LEFT}";A$
AR 110 IFA$<>"B"THEN320
DD 120 INPUT"{2 DOWN}{RVS}BACK
       GROUND COLOR:{OFF}
       {3 RIGHT}0{3 LEFT}";BC:
       BC$=CHR$(BC)
```

SOFTWARE DISCOUNTERS OF AMERICA



For Orders Only — 1-800-225-7638
PA Orders — 1-800-223-7784
Customer Service 412-361-5291

- Free shipping on orders over $100 in continental USA
- No Surcharge for VISA/MasterCard
- Your card is not charged until we ship

ABACUS BOOKS
Anatomy of the 1541 . . $14
Anatomy of the C64 . . $14
1571 Internals $14
GEOS Inside & Out . . . $13
GEOS Tricks & Tips . . . $13

ABACUS SOFTWARE
Assembler Monitor . . . $25
Basic $25
Basic 128 . . . . . $39
*Becker Basic $33
Cad Pak $25
Cad Pak 128 . . . . . $39
Chart Pak $25
Chart Pak 128 . . . . . $25
Cobol $25
Cobol 128 . . . . . $25
PPM $25
PPM 128 . . . . . $39
Speed Term 64 or 128 $25
Super C $39
Super C 128 . . . . . $39
Super Pascal $39
Super Pascal 128 . . . . . $39
TAS $25
TAS 128 . . . . . $39
*Requires GEOS!

ACCESS
Echelon w/Lip Stik . . . $29
Famous Course Disk #1 for World Class L.B. . $14
Famous Course Disk #2 for World Class L.B. . $14
Famous Course Disk #3 for World Class L.B. . $14
Leader Board (Original) 3 Pack $14
Tenth Frame $25
Triple Pack: BH1, BH2, Raid Over Moscow . $14
World Class Leader Board $25

ACCOLADE
Apollo 18: Mission to the Moon $19
Bubble Ghost $19
Card Sharks $19
Fast Break . . . . . Call
4th & Inches Football . $19
4th & Inches Team Construction Disk . $9.88
Mini Putt $19
Power at Sea $19
Rack 'Em . . . . . Call
Serve & Volley . . . . . Call
Test Drive $19
The Train: Escape to Normandy $19
T.K.O. . . . . Call

ACTION SOFT
Thunder Chopper $19
Up Periscope! $19

ACTIVISION
Black Jack Academy . . $25
Crossbow $19
Mainframe . . . . . Call
Maniac Mansion $23
Might & Magic $25
Music Studio $23
Postcards $16
Shanghai $19
Sky Travel $33
The Last Ninja $23

AMERICAN EDUCATIONAL
Biology $12
Learn to Read (Gr. 1-4) $25
Phonics (K-3) $25
Science: Grades 3/4 . . . $12
Science: Grades 5/6 . . . $12
Science: Grades 7/8 . . . $12
US Geography $12
US History $12
World Geography $12
World History $12

ARTWORX
Bridge 5.0 . . . . . $19
Cycle Knight $14
International Hockey . . $14
Linkword French $16
Linkword German $16
Linkword Russian $16
Linkword Spanish $16
Strip Poker $21
Data Disk #1 Female . . $14
Data Disk #2 Male . . . $14
Data Disk #3 Female . . $14

AVALON HILL
NBA Basketball $25
NBA '85-86 Season Disk $14
Spitfire '40 . . . . . $23
Super Sunday $21
SBS 1986 Team Disk . . $14
SBS Gen. Mgr. Disk . . . $19
Under Fire $23

BATTERIES INCLUDED
Paperclip Publisher . . . $33
Paperclip 3 . . . . . $33

BAUDVILLE
Award Maker Plus $25
Blazing Paddles $23
Rainy Day Games $19
Video Vegas $19

BERKELEY SOFTWORKS
Geos 128 . . . . . $44
Geo-Calc 128 . . . . . $44
Geo-File 128 . . . . . $44
Geo-Write Workshop 128 $44
Geos 64 . . . . . $39
*Desk Pack Plus $19
*Desk Pack Plus $19
*Geo-Calc $33
*Geo File $33
*Geo-Programmer $44
*Geo-Publish $33
*Requires Geos 64!

BOX OFFICE
California Raisins $16
Psycho $16

BRODERBUND
Bank St. Writer $33
Carmen Sandiego: Europe $25
USA $25
World $23
Downhill Challenge . . Call
Print Shop $26
P.S. Companion $23
P.S. Graphics Library #1, #2, or #3 . . . $16 Ea.
P.S. Graphics Library Holiday Edition $16
Toy Shop $19

CAPCOM
Ghosts & Goblins $19
Gunsmoke $19
Side Arms $19
Speed Rumbler $19

CBS
Success w/Algebra: Binomial Multiplication & Factoring $19
First Degree & Advanced Linear Equations . . $19
Graphing Linear Functions $19
Simultaneous & Quadratic Equations . $19
Success w/Math: Addition & Subt $19
Decimals: Add. & Subt. $19
Decimals: Mult. & Div. $19
Fractions: Add. & Subt. $19
Fractions: Mult. & Div. $19
Multiplication & Division $19

CINEMAWARE
Defender of the Crown $23
Sinbad: Throne of the Falcon $23
The Three Stooges $23
Warp Speed (R) $33

CMS
General Acct. 128 . . . $119
Inventory 128 . . . . . $49

DATA EAST
Breakthru $19
Commando $14
Ikari Warriors $19
Karnov $19
Kid Niki $19
Lock On . . . . . Call
Speed Buggy $19
Tag Team Wrestling . . . $14
Victory Road . . . . . Call

DATASOFT
Alternate Reality: The City $19
The Dungeon $26
Battle Droidz $19
Bismarck $19
Dark Lord $14
Global Commander . . . $19
Hunt for Red October $26
Rubicon Alliance $14
Tobruk $21
Tomahawk $21
Video Title Shop w/ Graphics Companion $21

DAVIDSON
Algeblaster $32
Math Blaster $32
Spell It $32
Word Attack $32

DESIGNWARE
Body Transparent $19
Designasaurus . . . . . Call
Spellicopter $19

DIGITAL SOLUTIONS
Pocket Filer 2 . . . . . $33
Pocket Planner 2 . . . . . $33
Pocket Writer 2 . . . . . $33
*All 3 in 1 Super Pack $59

DIGITEK
Hollywood Poker $19
Vampire's Empire $19

ELECTRONIC ARTS
Alien Fires $19
Arctic Fox $23
Bard's Tale 1 or 2 . $26 Ea.
Bard's Tale 1 or 2 Hints $9 Ea.
Bards Tale 3: The Thief of Fate . . . $26
Chessmaster 2000 . . . . $26
Chuck Yaeger's AFT . . . $23
Demon Stalker $21
Dragon's Lair $19
Earth Orbit Station . . . $21
Instant Music $21
Legacy of Ancients . . . $21
Marble Madness $21
Master Ninja $19
Monopoly $21
Patton vs. Rommel $21
Pegasus $21
Roadwars $21
Rockford $21
Scrabble $23
Scruples $23
Skyfox 2 . . . . . $21
Skate or Die $21
Star Fleet 1 . . . . . $26
Strike Fleet $21
Twilights Ransom $23
Wasteland $26
World Tour Golf $21

EPYX
Boulder Dash Construction Kit $14
California Games $24
Champ. Wrestling $14
Create A Calendar $19
Death Sword $14
Destroyer $24
Dive Bomber $24
Fast Load (R) $24
Final Assault . . . . . Call
4 x 4 Off Road Racing $24
Impossible Mission 2 . $24
L.A. Crackdown $24
Legend of Blacksilver . Call
Metrocross $16
Mind-Roll . . . . . Call
Street Cat $16
Street Sports: Baseball $24
Basketball $24
Soccer $24
Rad Warrior $14
Spiderbot $14
Spy vs. Spy 3: Arctic Antics $14
Sub Battle Simulator . . $24
Summer Games $14
Summer Games 2 . . . . $14
Temple Apshai Trilogy . $14
The Games: Summer Edition $24
Winter Edition $24
Winter Games $14
World Games $24

GAMESTAR
GFL Ch. Football $23
Star Rank Boxing 2 . . . $19
Top Fuel Eliminator . . . $19

INFOCOM
Beyond Zork 128 . . . . . $29
Border Zone $23
Nord & Bert Couldn't Make Head or Tail of It . . . $23
Sherlock: The Riddle of the Crown Jewels $23
Zork Trilogy $29

INKWELL SYSTEMS
#170 Deluxe L.P. $69
#184C Light Pen $44
Flexidraw 5.5 . . . . . $23
Graphics Intregrator 2 $19

LOGICAL DESIGN
Club Backgammon . . . $19
Vegas Craps $19
Vegas Gambler $19

MELBOURNE HOUSE
Barbarian $19
John Elway's QB . . . . . Call

MICROLEAGUE
Baseball $25
Box Score Stats $16
General Manager $19
1986 Team Data Disk . $14
1987 Team Data Disk . $14
WWF Wrestling $19

MICROPROSE
Airborne Ranger $23
Conflict in Vietnam . . . $25
Crusade in Europe $25
F-15 Strike Eagle $23
Gunship $23
Pirates $25
Project Stealth Fighter $25
Red Storm Rising $25
Silent Service $23

MINDSCAPE
Bad Street Brawler . . . $19
Blockbuster $19
Bop & Wrestle $19
Captain Blood . . . . . Call
Clubhouse Sports $19
Color Me: The Computer Coloring Kit $23
Crossword Magic $19
*Deeper Dungeons . . . $16
De Ja Vu $23
Gauntlet $23
Harrier Combat Sim. . . $19
Indiana Jones & The Temple of Doom . . . $23
Indoor Sports $19
Infiltrator 1 or 2 . . $19 Ea.
Into the Eagle's Nest . . $19
Living Daylights $19
MISL Soccer $23
Paperboy $23
Perfect Score SAT $44
Road Runner $23
720 . . . . . Call
Super Star Ice Hockey $23
Super Star Soccer $23
Uninvited . . . . . Call
*Requires Gauntlet!

MISC
Bob's Term Pro $29
Bob's Term Pro 128 . . . $39
C.P. Copy 2 . . . . . $21
Doodle $25
Final Cartridge 3 . . . . . $47
Font Master 2 . . . . . $29
Font Master 128 . . . . . $35
Superbase 64 . . . . . $29
Superbase 128 . . . . . $39
Superscript 64 . . . . . $25
Superscript 128 . . . . . $29
Super Snapshot (R) . . . $47

ORIGIN
Autoduel $32
Moebius $25
Ogre $19
Ultima 1 or 3 . . . . $25 Ea.
Ultima 4 . . . . . $39
Ultima 5 . . . . . $39

PROFESSIONAL
Fleet System 2 Plus . . . $33
Fleet System 4 128 . . . $43

SIMON & SCHUSTER
JK Lasser Money Mgr. . $14
Typing Tutor 4 . . . . . $25

SIR TECH
Deep Space $25
Wizardry Series: Knight of Diamonds . $25
Proving Ground $25

SOFTWARE SIMULATIONS
Football $19
Pure Stat Baseball $25
Pure Stat College Basketball $25
*Data Disks Avail. . . . Call

SPRINGBOARD
Certificate Maker $14
C.M. Library Vol. 1 . . $9.88
Newsroom $14
N.R. Clip Art Vol. 1 . $9.88
N.R. Clip Art Vol. 2 . $9.88
N.R. Clip Art Vol. 3 . $9.88
P.S. Graphics Expander $23

SSI
Advanced Dungeons & Dragons: Heroes of the Lance $21
Pool of Radiance . $26
Battle of Antietam $32
B-24 . . . . . $23
Eternal Dagger $26
Gettysburg $39
Kampfgruppe $39
Panzer Strike! $29
Phantasie 1, 2 or 3 $26 Ea.
Questron 2 . . . . . $26
Rings of Zilfin $26
Roadwar 2000 . . . . . $26
Roadway Europa $26
Shard of Spring $26
Shiloh: Grant's Trial . . $26
Sons of Liberty $23
War Game Const. Set . $21
War in S. Pacific $39
Warship $39
Wizard's Crown $26

SUBLOGIC
Flight Simulator 2 . . . . $32
F.S. Scenery Disks . . . . Call
Jet $26
Stealth Mission $32

THREE SIXTY
Dark Castle $23
Warlock . . . . . Call

TIMEWORKS
Accts. Payable $33
Accts Receivable $33
Data Manager 2 . . . . . $14
Data Manager 128 . . . $33
Evelyn Wood Reader . . $14
General Ledger $33
Partner 64 (R) $25
Partner 128 (R) $33
Swiftcalc/Sideways (D) . $19
Swiftcalc/Sideways 128 $33
Sylvia Porter's Personal Fin. Planner 64 . . . . $25
Sylvia Porter's Personal Fin. Planner 128 . . . . $33
Word Writer 3 . . . . . $25
Word Writer 128 . . . . . $33

UNICORN
Decimal Dungeon $19
Fraction Action $19
Percentage Panic $19
Race Car Rithmetic . . . $19
Ten Little Robots $19

UNISON WORLD
Art Gallery 1 or 2 . $16 Ea.
Art Gallery: Fantasy . . . $16
Print Master Plus $23

WEEKLY READER
Stickybear Series: ABC's $16
Math 1 or 2 . . . . . $16 Ea.
Numbers $16
Opposites $16
Reading $16
Spellgrabber $16
Typing $16

ACCESSORIES
Animation Station $49
Bonus SS, DD . . $4.99 Bx.
Bonus DS, DD . . $5.99 Bx.
Compuserve Starter Kit $19
Contriver Mouse $39
Disk (Case (Holds 75) $6.88
Disk Drive Cleaner . . $6.88
Epyx 500 XJ Joystick . . $14
Icontroller $14
Suncom TAC 5 J.S. $14
Wico Bat Handle $17
Wico Boss $12
XETEC Super Graphix . $59
Xetec Super Graphix Gold $89
XETEC Super Graphix Jr. $39

*All programs on disk unless otherwise noted!

P.O. BOX 111327—DEPT. CG—BLAWNOX, PA 15238

*Please Read The Following Ordering Terms & Conditions Carefully Before Placing Your Order: Orders with cashiers check or money order shipped immediately on in stock items! Personal & Company checks, allow 3 weeks clearance. No C.O.D.'s! Shipping: Continental U.S.A.-Orders under $100 add $3; free shipping on orders over $100. AK, HI, FPO, APO-add $5 on all orders. Canada & Puerto Rico-add $10 on all orders. Sorry, no other International orders accepted! PA residents add 6% sales tax on the total amount of order including shipping charges. CUSTOMER SERVICE HOURS: Mon.-Fri. 9 AM-5:30 PM Eastern Time. REASONS FOR CALLING CUSTOMER SERVICE—412-361-5291 (1)Status of order or back order (2)if any merchandise purchased within 60 days from S.D.of A. is defective, please call for a return authorization number. We will not process a return without a return auth. #! Defective merchandise will be replaced with the same merchandise only. Other returns subject to a 20% restocking charge! After 60 days from your purchase date, please refer to the warranty included with the product purchased & return directly to the manufacturer. Customer service will not accept collect calls or calls on S.D.of A.'s 800# order lines! Prices & availability are subject to change! New titles are arriving daily! Please call for more information. NEW, MORE CONVENIENT ORDER LINE HOURS: Mon.-Thurs. 8:30 AM-7:00 PM Fri. 8:30 AM-5:30 PM Sat. 10:00 AM-4:00 PM Eastern Time.

SOFTWARE DISCOUNTERS OF AMERICA

S.D. of A.

For Orders Only—1-800-225-7638
PA Orders—1-800-223-7784
Customer Service 412-361-5291

- Free shipping on orders over $100 in continental USA
- No Surcharge for VISA/MasterCard
- Your card is not charged until we ship

Commodore 64/128 Bargain Basement—Dozens of Titles For Less Than $10!

HI-TECH EXPRESSIONS

A number game, using counting, adding and subtracting skills. Children help Grover work with numbers in five different ways as they play with the friendly Zips from the planet Zap.

Astro Grover
Our Discount Price $6.88

ACCOLADE
Ace of Aces $9.88
Fight Night $9.88
Hardball $9.88
Killed Until Dead ... $9.88

ACTIVISION
Aliens $9.88
Cross Country Road Race $9.88
Ghostbusters $9.88
Hacker 1 or 2 ... $9.88 Ea.
Little Computer People $9.88
Transformers $9.88

ARTWORX
Beach Blanket Volleyball $9.88
Equestrian Show Jumper $9.88
Highland Games $9.88
Police Cadet $9.88
Thai Boxing $9.88

AVANTAGE
Deceptor $9.88
Desert Fox $9.88
Plasmatron $9.88
Power $9.88
Project Space Station $9.88
Sigma 7 ..... $9.88
Spy vs. Spy 1 & 2 ... $9.88

BOX OFFICE
Alf $9.88

High Rollers $9.88
$100,000 Pyramid ... $9.88

BRODERBUND
Black Cauldron $9.88
Choplifter/David's Midnight Magic ... $9.88
Karateka $9.88
Loderunner $9.88
Magnetron $9.88

CBS
Argos Expedition ... $4.88
Math Mileage $4.88
Timebound $4.88
Weather Tamers $4.88

CDA
America Cooks Series:
American $9.88
Chinese $9.88
French $9.88
Italian $9.88
Mexican $9.88

DATA EAST
Express Raiders $8.88
Q-Bert $8.88
TNK III $8.88

EASY WORKING/ SPINNAKER
Filer $6.88
Planner $6.88
Writer $6.88

ELECTRONIC ARTS
Adv. Const. Set $9.88
Age of Adventure ... $9.88
America's Cup Sailing $9.88
Archon $9.88
Archon 2: Adept $9.88
Financial Cookbook . $9.88
Heart of Africa $9.88
Lords of Conquest .. $9.88
Mail Order Monsters $9.88
Mind Mirror $9.88
Movie Maker $9.88
M.U.L.E. $9.88
Murder Party $9.88
Music Const. Set ... $9.88
One-on-One $9.88
Pinball Const. Set ... $9.88
Racing Dest. Set $9.88
Realm of Impossibility $9.88
Seven Cities of Gold $9.88
Skyfox $9.88
Super Boulder Dash . $9.88
Touchdown Football . $9.88
Ultimate Wizard $9.88

EPYX
Gateway to Apshai .. $6.88
Pitstop 1 or 2 ... $6.88 Ea.
P.S. Graphics Scrapbook
#1: Sports $9.88
#2: Off the Wall .. $9.88
#3: School $9.88

Grover's Animal Adv. $6.88
Pals Around Town .. $6.88
Sesame St. Print Kit . $9.88

INFOCOM
Hitchhiker's Guide .. $9.88
Infocomics ..... Call
Leather Goddesses .. $9.88
Zork 1 ..... $9.88

KONAMI/ACTION CITY
Circus Charlie $9.88
Hyper Sports/Ping Pong $9.88
Track & Field $9.88

MASTERTRONIC
Action Biker $4.88
Bounder $6.88
Captain Zap $6.88
Energy Warrior $6.88
Excaliba $4.88
Feud $6.88
Kane $4.88
Knight Games $6.88
Last V-8 ..... $4.88
Ninja $4.88
Pro Golf $4.88
Prowler: War in 2150 $6.88
Shogun $6.88
Speed King $6.88
Squash $6.88
Storm $6.88

THUNDER MOUNTAIN

Top Gun™ puts you in the fighter pilots seat of a technologically advanced F-14 Tomcat.

Top Gun™
Our Discount Price $6.88

Dark Tower $4.88
Film Maker $4.88
Fraction Fever $4.88
Gold Record Race ... $4.88
Karate Chop $6.88
Learn the Alphabet .. $4.88
Learn to Spell $4.88
Learn to Add $4.88
Letter Scrambler $4.88
Railroad Tycoon $4.88
Ranch $4.88
Story Machine $4.88

SSI
Computer QB $9.88
Gemstone Healer ... $9.88
Gemstone Warrior ... $9.88
President Elect $9.88
Questron $9.88

TELARIUM
Nine Princes in Amber $9.88
Perry Mason: Case of Mandarin Murder .. $9.88

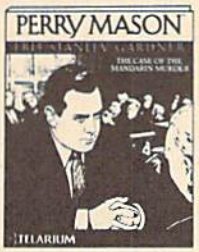
THUNDER MOUNTAIN
Army Moves $6.88
Dig Dug $6.88
Doc the Destroyer ... $6.88
Felony $6.88
Galaxian $6.88
Great Escape $6.88
Implosion $9.88
Jr. Pac Man $6.88
Leviathan $6.88
Ms. Pac Man $6.88
Murder by the Dozen $6.88
Music Writer $6.88
Mutants $9.88
Pac Man $6.88
Pole Position $6.88
Rambo: First Blood Part II $6.88
Slot Car Racer $6.88
Super Pac Man $9.88
Tai-Pan $9.88
Tau-Ceti $9.88
Top Gun $6.88
Winter Challenge $9.88
Wizball $9.88

VALUE WARE
Artist $4.88
Educator $4.88
Entertainer $4.88
Home Banker $4.88
Home Manager $4.88
Kitchen Manager $4.88

*All programs on disk unless otherwise noted!

TELARIUM

The first interactive mystery to use the world-famous criminal lawyer.



Perry Mason
Our Discount Price $9.88

GAMESTAR
Champ. Baseball $9.88
Champ. Basketball .. $9.88
On Court Tennis $9.88
Star League Baseball/ On Field Football . $9.88

HES
Microsoft Multiplan . $9.88

HI-TECH EXPRESSIONS
Award Ware $9.88
Card Ware $6.88
Matterhorn Screamer $6.88
Party Ware $9.88
Print Power $9.88
Tom Sawyer's Island . $6.88
Win, Lose or Draw ... Call

HI-TECH EXPRESSIONS
Sesame Street Series:
Astro-Grover $6.88
Big Bird's Special Delivery $6.88
Ernie's Big Splash ... $6.88
Ernie's Magic Shapes $6.88

Vegas Poker & Jackpot $4.88
Water Polo $6.88
Wing Commander ... $4.88

SEGA
Congo Bongo (R) $4.88
Super Zaxxon (R) $4.88

SHARE DATA
Concentration $9.88
Family Feud $8.88
Jeopardy $8.88
Jeopardy Jr. $9.88
Wheel of Fortune ... $8.88
Wheel of Fortune 2 .. $9.88

SIMON & SCHUSTER
Great Int'l. Paper Airplane Construction Set ... $9.88

SPECTRUM HOLOBYTE
Gato $9.88

SPINNAKER
Alf in the Color Cave $4.88
Bubble Busters $4.88
Cosmic Combat $4.88

Ask About Our Super Specials!!!

INFOCOM

Every bit as outrageous and funny as the novel.

Hitchhiker's Guide to the Galaxy
Our Discount Price $9.88

HI-TECH EXPRESSIONS

A matching game, using object recognition and classification skills. Children help Big Bird and Little Bird deliver packages to the right stores.

Big Bird's Special Delivery
Our Discount Price $6.88

P.O. BOX 111327—DEPT. CG—BLAWNOX, PA 15238

*Please Read The Following Ordering Terms & Conditions Carefully Before Placing Your Order: Orders with cashiers check or money order shipped immediately on in stock items! Personal & Company checks, allow 3 weeks clearance. No C.O.D.'s! Shipping: Continental U.S.A.-Orders under $100 add $3; free shipping on orders over $100. AK, HI, FPO, APO-add $5 on all orders. Canada & Puerto Rico-add $10 on all orders. Sorry, no other International orders accepted! PA residents add 6% sales tax on the total amount of order including shipping charges. CUSTOMER SERVICE HOURS: Mon.-Fri. 9 AM-5:30 PM Eastern Time. REASONS FOR CALLING CUSTOMER SERVICE—412-361-5291 (1)Status of order or back order (2)if any merchandise purchased within 60 days from S.D.of A. is defective, please call for a return authorization number. We will not process a return without a return auth. #! Defective merchandise will be replaced with the same merchandise only. Other returns subject to a 20% restocking charge! After 60 days from your purchase date, please refer to the warranty included with the product purchased & return directly to the manufacturer. Customer service will not accept collect calls or calls on S.D.of A.'s 800# order lines! Prices & availability are subject to change! New titles are arriving daily! Please call for more information. NEW, MORE CONVENIENT ORDER LINE HOURS: Mon.-Thurs. 8:30 AM-7:00 PM Fri. 8:30 AM-5:30 PM Sat. 10:00 AM-4:00 PM Eastern Time.

```
DH 130 INPUT"{2 DOWN}{RVS}BORD
       ER COLOR:{OFF}{3 RIGHT}
       0{3 LEFT}";B2:B2$=CHR$(
       B2)
FB 140 INPUT"{2 DOWN}{RVS}TEXT
        COLOR:{OFF}{3 RIGHT}6
       {3 LEFT}";T1:T1$=CHR$(T
       1)
XH 150 INPUT"{2 DOWN}{RVS}FILE
       NAME{OFF}";A$
KJ 160 INPUT"{2 DOWN}{RVS}STAR
       T ADDRESS{OFF}";B$:IFLE
       FT$(B$,1)="$"THENGOSUB4
       10:GOTO180
FB 170 AD=VAL(B$):HB=INT(AD/25
       6):LB=AD-HB*256
PQ 180 FD$(CF)=CHR$(LB):FD$(CF
       )=FD$(CF)+CHR$(HB)
XG 190 IFLEN(A$)>=16THEN210
XJ 200 FORI=LEN(A$)TO16:A$=A$+
       CHR$(160):NEXTI
ES 210 FD$(CF)=FD$(CF)+LEFT$(A
       $,16)
GK 220 INPUT"{2 DOWN}{RVS}ANOT
       HER FILE (Y/N){3 RIGHT}
       N{3 LEFT}{OFF}";G$
GK 230 IFG$="Y"ANDCF<9THENCF=C
       F+1:GOTO150
BX 240 IFCF=9THENPRINT"
       {2 DOWN}{RVS}TOO MANY F
       ILES...{OFF}"
FG 250 GOTO530:REM VERIFY DATA
JC 260 OPEN15,8,15,"S0:BOOT.DA
       T":CLOSE15:OPEN2,8,2,"0
       :BOOT.DAT,S,W"
KP 270 PRINT#2,BC$;:PRINT#2,B2
       $;:PRINT#2,T1$;
XF 280 PRINT#2,CHR$(CF+1);
KR 290 FORI=0TOCF:PRINT#2,FD$(
       I);:NEXTI
SC 300 CLOSE2:END
MQ 310 PRINT"{2 DOWN}{RVS}DATA
        FILE CONTENTS:{OFF}
       {2 DOWN}"
RJ 320 OPEN2,8,2,"0:BOOT.DAT,S
       ,R"
BP 330 FORFC=1TO3:GET#2,A$:CF=
       ASC(A$+CHR$(0)):PRINTCF
       ,:NEXTFC:PRINT
KQ 340 GET#2,A$:CF=ASC(A$):PRI
       NTCF
GR 350 FORI=1TOCF:FORJ=1TO2:GE
       T#2,A$:PRINTASC(A$+CHR$
       (0));:NEXTJ:REM LOAD AD
       DRESS
DE 360 A$="":FOR J=0TO15:GET#2
       ,B$:A$=A$+B$:NEXTJ:PRIN
       TA$:NEXTI
KD 370 CLOSE2
FA 380 INPUT"{2 DOWN}{RVS}DO Y
       OU WISH TO MAKE A CHANG
       E{2 RIGHT}N{3 LEFT}";A$
XH 390 IFA$="Y"THEN70
AS 400 END
AC 410 L$=RIGHT$(B$,2):H$=MID$
       (B$,2,LEN(B$)-3)
AQ 420 N$=L$:GOSUB450:LB=N
MP 430 HB=0:IFLEN(H$)>0THENN$=
       H$:GOSUB450:HB=N
BB 440 RETURN
SH 450 EQ=0:REM CONVERT A STRI
       NG TO A BYTE
JE 460 LN$=RIGHT$(N$,1)
JD 470 IFLN$=CV$(EQ,0)THENN=VA
       L(CV$(EQ,1)):GOTO490
EH 480 EQ=EQ+1:GOTO470
SA 490 HN$=LEFT$(N$,1):EQ=0
KA 500 IFHN$=CV$(EQ,0)THENN=N+
       16*VAL(CV$(EQ,1)):GOTO5
       20
SC 510 EQ=EQ+1:GOTO500
EG 520 RETURN
XS 530 PRINT"{2 DOWN}{RVS}DATA
        FILE CONTENTS:{OFF}
       {2 DOWN}"
GF 540 PRINTBC,B2,T1
GX 550 PRINTCF+1
JC 560 FORI=0TOCF:FORJ=1TO2:PR
       INTASC(MID$(FD$(I),J,1)
       +CHR$(0));:NEXTJ
SX 570 PRINTRIGHT$(FD$(I),16):
       NEXTI
QE 580 INPUT"{2 DOWN}{RVS}DO Y
       OU WISH TO MAKE A CHANG
       E{2 RIGHT}N{3 LEFT}";A$
EA 590 IFA$="Y"THEN70
DK 600 GOTO260
```

Lincoln Green

See instructions in article on page 37 before typing in.

```
0801:0B 08 FF FF 9E 32 30 39 EF
0809:39 00 29 08 FF FF 8F 14 8E
0811:14 14 14 14 14 14 14 14 21
0819:43 2E 20 31 39 38 38 20 A8
0821:43 4F 4D 50 55 54 45 21 FC
0829:20 50 55 42 4C 2E 20 00 87
0831:00 00 A9 93 20 D2 FF A9 A5
0839:8E 20 D2 FF A9 08 20 D2 73
0841:FF A9 80 8D 0E D4 8D 0F 92
0849:D4 8D 12 D4 20 95 0B 20 44
0851:28 0E 20 B5 0C 20 0E 0D 62
0859:20 DD 0F 20 0A 14 20 31 E6
0861:14 4C 44 13 20 4D 14 A5 4C
0869:C5 C9 21 D0 03 4C 2F 15 BC
0871:AD 00 DC 29 0F C9 0E D0 13
0879:03 4C 92 08 C9 0D D0 03 18
0881:4C AE 08 C9 07 D0 03 4C CE
0889:CA 08 C9 0B D0 D3 4C E6 40
0891:08 AD 57 05 C9 20 F0 03 FF
0899:4C 9F 13 20 08 0B 20 08 D0
08A1:0B 20 08 0B 20 08 0B 20 48
08A9:D9 0B 4C 9C 14 AD 97 06 49
08B1:C9 20 F0 03 4C 9F 13 20 24
08B9:B3 0A 20 B3 0A 20 B3 0A A7
08C1:20 B3 0A 20 D9 0B 4C AD 53
08C9:14 AD FB 05 C9 20 F0 03 D2
08D1:4C 9F 13 20 02 09 20 02 CA
08D9:09 20 02 09 20 02 09 20 82
08E1:5C 0C 4C 7A 14 AD F3 05 98
08E9:C9 20 F0 03 4C 9F 13 20 5C
08F1:80 0A 20 80 0A 20 80 0A AC
08F9:20 80 0A 20 5C 0C 4C 8B B4
0901:14 20 ED 0E 20 4E 0B 20 34
0909:62 0B 8D 5F 15 20 6D 0B C5
0911:C8 20 73 0B 88 20 76 0B 6B
0919:C8 C0 27 90 F3 20 79 0B CB
0921:A0 00 20 F0 0A EE 5F 15 76
0929:AD 5F 15 C9 18 90 DE 4C 36
0931:58 0B F0 F2 EF E7 F2 E1 66
0939:ED A0 E2 F9 A0 F2 EF E2 F9
0941:E5 F2 F4 A0 E2 E9 F8 E2 3F
0949:F9 B3 B0 B0 B6 A0 F3 F4 7B
0951:EF EE E5 E3 F5 F4 F4 E5 65
0959:F2 A0 F4 E5 F2 F2 E1 E3 15
0961:E5 E7 F2 E5 E5 EE F3 E2 D2
0969:EF F2 EF AC A0 EE E3 A0 22
0971:B2 B7 B4 B0 B5 00 00 00 1A
0979:00 00 00 00 00 00 00 00 8B
0981:00 00 00 00 00 00 00 00 93
0989:00 00 00 00 00 00 00 00 9B
0991:00 00 00 00 00 00 00 00 A3
0999:00 00 00 00 00 FF FF FF AB
09A1:FF FF FF 00 00 00 00 00 B3
09A9:00 00 00 00 00 00 00 00 BB
09B1:00 00 00 00 00 00 00 00 C3
09B9:00 00 00 00 00 00 00 00 CB
09C1:30 00 00 30 00 00 30 00 4F
09C9:00 30 00 00 30 00 00 30 99
09D1:00 00 30 00 00 30 00 00 AA
09D9:30 00 00 30 00 00 30 00 67
09E1:00 30 00 00 30 00 00 30 B1
09E9:00 00 30 00 00 30 00 00 C2
09F1:30 00 00 30 00 00 30 00 7F
09F9:00 30 00 00 30 00 00 C0 5A
0A01:00 00 60 00 00 30 00 00 E1
0A09:18 00 00 0C 00 00 06 00 F5
0A11:00 03 00 00 01 80 00 00 EF
0A19:C0 00 00 60 00 00 30 00 F3
0A21:00 18 00 00 0C 00 00 06 A1
0A29:00 00 03 00 00 01 80 00 A2
0A31:00 C0 00 00 60 00 00 30 A8
0A39:00 00 18 00 00 0C 00 00 80
0A41:00 01 00 00 03 00 00 06 B3
0A49:00 00 0C 00 00 18 00 00 3F
0A51:30 00 00 60 00 00 C0 00 05
0A59:01 80 00 03 00 00 06 00 4A
0A61:00 0C 00 00 18 00 00 30 69
0A69:00 00 60 00 00 C0 00 01 8D
0A71:80 00 03 00 00 06 00 00 3E
0A79:0C 00 00 18 00 00 00 20 35
0A81:3D 0F 20 4E 0B 20 62 0B 89
0A89:8D 5F 15 A0 27 20 6D 0B 88
0A91:88 20 73 0B C8 20 76 0B CF
0A99:88 C0 00 D0 F3 20 79 0B 4D
0AA1:A0 27 20 F0 0A EE 5F 15 C2
0AA9:AD 5F 15 C9 18 90 DE 4C B8
0AB1:58 0B 20 8D 0F 20 4E 0B 32
0AB9:20 62 0B 8D 5F 15 20 7F BF
0AC1:0B A0 00 20 F0 0A 20 73 E8
0AC9:0B 8D 5D 15 20 FC 0A AD 7A
0AD1:5D 15 20 76 0B C8 C0 28 6A
0AD9:90 E9 20 F0 0A A0 00 EE 85
0AE1:5F 15 AD 5F 15 C9 17 90 25
0AE9:DA 20 8A 0B 4C 58 0B A5 F4
0AF1:FB 18 69 28 85 FB 90 02 F8
0AF9:E6 FC 60 A5 FB 38 E9 28 E3
0B01:85 FB B0 02 C6 FC 60 20 1A
0B09:B5 0F 20 4E 0B A9 07 85 39
0B11:FC A9 98 85 FB A9 00 8D 8F
0B19:5F 15 A8 AA 20 7F 0B A0 99
0B21:00 20 FC 0A 20 73 0B 8D F1
0B29:5D 15 20 F0 0A AD 5D 15 1D
0B31:20 76 0B C8 C0 28 90 E9 94
0B39:20 FC 0A A0 00 EE 5F 15 79
0B41:AD 5F 15 C9 17 90 DA 20 16
0B49:8A 0B 4C 58 0B 8D 64 15 E2
0B51:8E 65 15 8C 66 15 60 AD 69
0B59:64 15 AE 65 15 AC 66 15 50
0B61:60 A9 04 85 FC A9 00 85 FE
0B69:FB A8 AA 60 B1 FB 8D 5D F8
0B71:15 60 B1 FB 60 91 FB 60 C1
0B79:AD 5D 15 91 FB 60 B1 FB 3A
0B81:99 A7 02 C8 C0 28 90 F6 D9
0B89:60 B9 A7 02 91 FB C8 C0 22
0B91:28 90 F6 60 AD 18 D0 29 5D
0B99:F0 09 0C 8D 18 D0 A9 7F 9B
0BA1:8D 0D DC A9 33 85 01 A9 53
0BA9:30 85 FC A9 00 85 FB 85 07
0BB1:FD A8 A9 D0 85 FE B1 FD BC
0BB9:91 FB C8 D0 F9 E6 FC E6 0A
0BC1:FE A5 FC C9 38 90 EF A9 8A
0BC9:37 85 01 A9 81 8D 0D DC D0
0BD1:60 60 60 60 60 60 60 60 E7
0BD9:20 A4 0C AD 1B D4 29 04 08
0BE1:AA BD 1C 0C 91 FB A9 28 F8
0BE9:85 FB BD 24 0C 91 FB A9 04
0BF1:50 85 FB BD 2C 0C 91 FB 9D
0BF9:A9 78 85 FB BD 34 0C 91 DB
0C01:FB A9 00 85 FB C8 E8 EE 9D
0C09:67 15 AD 67 15 C9 04 90 AE
0C11:D0 A9 00 8D 67 15 C0 28 0E
0C19:90 C1 60 A0 A1 A2 A3 20 FE
0C21:20 20 20 A4 A5 A6 A7 20 D6
0C29:20 20 20 A8 A9 AA AB 20 57
0C31:20 20 20 AC AD AE AF 20 D7
0C39:20 20 20 A0 A4 A8 AC 20 B8
0C41:20 20 20 A1 A5 A9 AD 20 DE
0C49:20 20 20 A2 A6 AA AE 20 05
0C51:20 20 20 A3 A7 AB AF 20 2B
0C59:20 20 20 20 A4 0C AD 1B 5B
0C61:D4 29 04 AA BD 3C 0C 91 E1
0C69:FB C8 BD 44 0C 91 FB C8 15
0C71:BD 4C 0C 91 FB C8 BD 54 E8
0C79:0C 91 FB A0 00 A5 FB 18 2C
0C81:69 28 85 FB 90 02 E6 FC 20
0C89:E8 EE 68 15 AD 68 15 C9 33
0C91:04 90 D1 A9 00 8D 68 15 C0
```

```
0C99:EE 67 15 AD 67 15 C9 06 A9
0CA1:90 BC 60 A9 04 85 FC A9 B1
0CA9:00 85 FB A8 AA 8D 67 15 9C
0CB1:8D 68 15 60 AD 36 0E 8D 43
0CB9:20 D0 8D 21 D0 A9 D8 85 3E
0CC1:FC A9 00 85 FB A8 AA AD A0
0CC9:36 0E 91 FB C8 C0 A0 90 8D
0CD1:F6 84 FB A0 00 AD 36 0E 41
0CD9:91 FB C8 C0 04 90 F6 A9 D8
0CE1:05 91 FB C8 C0 28 90 F7 AC
0CE9:A0 00 A5 FB 18 69 28 85 03
0CF1:FB 90 02 E6 FC A5 FC C9 1D
0CF9:DB 90 D8 A5 FB C9 C0 90 B2
0D01:D2 A0 00 A9 01 91 FB C8 56
0D09:C0 28 90 F7 60 A9 0D 8D 70
0D11:F8 07 A9 26 8D F9 07 A9 0D
0D19:27 8D FA 07 A9 28 8D FB FE
0D21:07 A9 29 8D FC 07 A9 05 83
0D29:8D 27 D0 A9 01 8D 15 D0 C1
0D31:A9 07 8D 28 D0 8D 29 D0 F5
0D39:8D 2A D0 8D 2B D0 A9 01 88
0D41:8D 1C D0 A9 BC 8D 00 D0 CA
0D49:A9 96 8D 01 D0 A9 00 8D 5A
0D51:10 D0 A9 03 8D 25 D0 A9 59
0D59:0D 8D 26 D0 A9 00 8D 69 01
0D61:15 A9 02 8D 6C 15 A9 58 EC
0D69:8D 6B 15 A9 04 8D 70 15 AE
0D71:8D 6E 15 A9 4C 8D 6F 15 B7
0D79:A9 4C 8D 6D 15 A9 01 8D E2
0D81:75 15 AD 1B D4 29 01 F0 41
0D89:08 A9 FF 8D E2 15 4C 95 84
0D91:0D 8D E2 15 AD 1B D4 29 EF
0D99:01 F0 08 A9 FF 8D E3 15 1F
0DA1:4C A7 0D 8D E3 15 60 00 7A
0DA9:00 00 00 00 0F 3F FF 00 39
0DB1:0F 3F FF FF FF FF FF 00 23
0DB9:F0 FC FF FF FF FF FF 00 8B
0DC1:00 00 00 00 F0 FC FF FF 57
0DC9:FF FF FF FF FF FF FF FF E3
0DD1:FF FF FF FF FF FF FF FF EB
0DD9:FF FF FF FF FF FF FF FF F3
0DE1:FF FF FF FF FF FF FF FF FB
0DE9:3F 0F 00 00 00 00 00 FF 67
0DF1:FF FF FF FF 3F 0F 00 FF 42
0DF9:FF FF FF FF FC F0 00 FF BF
0E01:FC F0 00 00 00 00 00 00 D7
0E09:00 00 00 00 00 00 00 01 26
0E11:02 05 02 05 0A 15 2A 40 39
0E19:80 40 A0 50 A8 54 AA 00 8A
0E21:00 00 00 00 00 00 00 A0 DD
0E29:00 B9 A8 0D 99 00 35 C8 99
0E31:C0 80 90 F5 60 09 AD 02 C3
0E39:D0 18 6D 75 15 8D 02 D0 7C
0E41:90 08 AD 10 D0 49 02 8D 9B
0E49:10 D0 AD 05 D0 18 6D 75 DE
0E51:15 8D 05 D0 AD 07 D0 18 4C
0E59:6D 75 15 8D 07 D0 AD 06 E1
0E61:D0 18 6D 75 15 8D 06 D0 AC
0E69:90 08 AD 10 D0 49 08 8D CF
0E71:10 D0 AD 09 D0 38 ED 75 C8
0E79:15 8D 09 D0 AD 08 D0 18 F8
0E81:6D 75 15 8D 08 D0 90 08 D9
0E89:AD 10 D0 49 10 8D 10 D0 D6
0E91:60 AD 02 D0 38 ED 75 15 10
0E99:8D 02 D0 B0 08 AD 10 D0 0A
0EA1:49 02 8D 10 D0 AD 05 D0 AD
0EA9:38 ED 75 15 8D 05 D0 AD 2D
0EB1:07 D0 38 ED 75 15 8D 07 8D
0EB9:D0 AD 06 D0 38 ED 75 15 F0
0EC1:8D 06 D0 B0 08 AD 10 D0 33
0EC9:49 08 8D 10 D0 AD 09 D0 5F
0ED1:18 6D 75 15 8D 09 D0 AD 35
0ED9:08 D0 38 ED 75 15 8D 08 37
0EE1:D0 B0 08 AD 10 D0 49 10 D4
0EE9:8D 10 D0 60 20 C0 12 AD C6
0EF1:02 D0 38 E9 08 8D 02 D0 34
0EF9:B0 08 AD 10 D0 49 02 8D 64
0F01:10 D0 AD 04 D0 38 E9 08 94
0F09:8D 04 D0 B0 08 AD 10 D0 FB
0F11:49 04 8D 10 D0 AD 06 D0 A1
0F19:38 E9 08 8D 06 D0 B0 08 84
0F21:AD 10 D0 49 08 8D 10 D0 30
0F29:AD 08 D0 38 E9 08 8D 08 50
0F31:D0 B0 08 AD 10 D0 49 10 26
0F39:8D 10 D0 60 20 18 13 AD 77
0F41:02 D0 18 69 08 8D 02 D0 79
0F49:90 08 AD 10 D0 49 02 8D A5
0F51:10 D0 AD 04 D0 18 69 08 63
0F59:8D 04 D0 90 08 AD 10 D0 4A
0F61:49 04 8D 10 D0 AD 06 D0 F1
0F69:18 69 08 8D 06 D0 90 08 64
0F71:AD 10 D0 49 08 8D 10 D0 80
0F79:AD 08 D0 18 69 08 8D 08 9A
0F81:D0 B0 08 AD 10 D0 49 10 76
0F89:8D 10 D0 60 20 EC 12 AD 19
0F91:03 D0 38 E9 08 8D 03 D0 58
0F99:AD 05 D0 38 E9 08 8D 05 FC
0FA1:D0 AD 07 D0 38 E9 08 8D 88
0FA9:07 D0 AD 09 D0 38 E9 08 09
0FB1:8D 09 D0 60 20 EC 12 AD 7F
0FB9:03 D0 18 69 08 8D 03 D0 74
0FC1:AD 05 D0 18 69 08 8D 05 1F
0FC9:D0 AD 07 D0 18 69 08 8D AD
0FD1:07 D0 AD 09 D0 18 69 08 AF
0FD9:8D 09 D0 60 78 A9 EA 8D EE
0FE1:14 03 A9 0F 8D 15 03 58 10
0FE9:60 20 01 15 AD CF 10 C9 48
0FF1:08 D0 1B AD 1B D4 29 07 0C
0FF9:8D CF 10 20 E8 13 AD CF 95
1001:10 C9 04 90 06 20 08 11 F6
1009:4C 74 10 20 D0 10 AD CF 62
1011:10 D0 1C AD 71 15 20 37 23
1019:0E AD 02 D0 C9 64 90 50 4A
1021:AD 10 D0 29 02 F0 49 A9 D8
1029:08 8D CF 10 4C 71 10 C9 BD
1031:01 D0 13 AD 72 15 8D 15 5B
1039:D0 20 37 0E AD 05 D0 C9 7E
1041:FA B0 E4 4C 71 10 C9 02 CD
1049:D0 11 AD 73 15 8D 15 D0 DC
1051:20 37 0E AD 07 D0 D0 18 21
1059:4C 28 10 C9 03 D0 14 AD 79
1061:74 15 8D 15 D0 20 37 0E 87
1069:AD 09 D0 D0 03 4C 28 10 73
1071:4C 31 EA C9 04 D0 18 AD 3F
1079:71 15 8D 15 D0 20 92 0E D4
1081:AD 02 D0 D0 EB AD 10 D0 27
1089:29 02 D0 E4 4C 28 10 C9 14
1091:05 D0 11 AD 72 15 8D 15 7D
1099:D0 20 92 0E AD 05 D0 D0 51
10A1:CF 4C 28 10 C9 06 D0 11 DB
10A9:AD 73 15 8D 15 D0 20 92 B7
10B1:0E AD 07 D0 D0 BA 4C 28 64
10B9:10 C9 07 D0 B3 AD 74 15 94
10C1:8D 15 D0 20 92 0E AD 09 3B
10C9:D0 D0 A5 4C 28 10 04 A9 33
10D1:BC 8D 00 D0 A9 96 8D 01 84
10D9:D0 A9 00 8D 02 D0 A9 96 E2
10E1:8D 03 D0 A9 BA 8D 04 D0 23
10E9:A9 00 8D 05 D0 A9 28 8D EB
10F1:06 D0 A9 00 8D 07 D0 A9 52
10F9:4E 8D 08 D0 A9 FA 8D 09 10
1101:D0 A9 00 8D 10 D0 60 A9 FC
1109:BC 8D 00 D0 A9 96 8D 01 BD
1111:D0 A9 64 8D 02 D0 A9 96 A8
1119:8D 03 D0 A9 00 8D 04 D0 86
1121:A9 C8 8D 05 D0 A9 FF 8D 07
1129:06 D0 A9 DC 8D 07 D0 A9 59
1131:5A 8D 08 D0 A9 00 8D 09 63
1139:D0 A9 12 8D 10 D0 60 00 CD
1141:10 00 00 10 00 00 68 00 3D
1149:00 68 00 01 55 00 00 58 98
1151:00 00 58 00 01 A9 00 04 31
1159:6A 40 04 68 40 04 65 00 A4
1161:00 68 00 00 58 00 00 44 A4
1169:00 00 45 00 00 44 00 00 45
1171:45 00 00 43 00 00 40 00 EA
1179:00 40 00 00 C0 00 00 00 B1
1181:10 00 00 10 00 00 68 00 7D
1189:00 68 00 01 55 00 00 58 D8
1191:00 00 58 00 01 A9 00 04 71
1199:6A 40 04 A8 40 01 68 40 23
11A1:00 A8 00 00 58 00 00 F8 A9
11A9:00 00 74 00 00 44 00 01 6C
11B1:44 00 02 04 00 00 04 00 7E
11B9:00 04 00 00 0C 00 00 00 3D
11C1:50 00 00 50 00 00 28 00 61
11C9:00 28 00 00 55 00 00 28 C8
11D1:00 00 28 00 00 28 00 00 99
11D9:18 00 00 18 00 00 15 00 B3
11E1:00 28 00 00 18 00 00 38 07
11E9:00 00 14 00 00 14 00 00 DE
11F1:14 00 0D 54 00 08 20 00 65
11F9:00 10 00 00 38 00 00 00 E1
1201:50 00 00 50 00 00 28 00 A2
1209:00 28 00 00 55 00 00 28 0A
1211:00 00 28 00 00 28 00 00 DA
1219:28 00 00 28 00 00 28 00 24
1221:00 28 00 00 28 00 00 18 A8
1229:00 00 10 00 00 18 00 00 AF
1231:18 00 00 10 00 00 10 00 82
1239:00 10 00 00 38 00 00 00 23
1241:05 00 00 05 00 00 28 00 88
1249:00 28 00 00 55 00 00 28 4A
1251:00 00 28 00 00 19 00 00 DE
1259:18 00 00 18 00 01 58 40 FF
1261:00 28 00 00 18 00 00 38 88
1269:00 00 14 00 00 14 00 00 60
1271:14 00 00 15 00 00 08 00 01
1279:00 04 00 00 2C 00 00 00 FF
1281:05 00 00 05 00 00 28 00 C8
1289:00 28 00 00 55 00 00 28 8A
1291:00 00 28 00 00 25 00 00 4F
1299:28 00 00 28 00 00 08 00 64
12A1:00 28 00 00 18 00 00 38 C8
12A9:00 00 24 00 00 24 00 00 E2
12B1:24 00 00 05 00 00 03 28 66
12B9:00 05 00 00 23 00 00 20 58
12C1:C1 13 AD 6A 15 F0 11 A0 17
12C9:00 8C 6A 15 B9 C0 11 99 3C
12D1:40 03 C8 C0 40 90 F5 60 8C
12D9:A0 00 A9 01 8D 6A 15 B9 8D
12E1:00 12 99 40 03 C8 C0 40 BE
12E9:90 F5 60 20 C1 13 AD 6A 02
12F1:15 F0 11 A0 00 8C 6A 15 25
12F9:B9 40 11 99 40 03 C8 C0 27
1301:40 90 F5 60 A0 00 A9 01 89
1309:8D 6A 15 B9 80 11 99 40 8A
1311:03 C8 C0 40 90 F5 60 20 44
1319:C1 13 AD 6A 15 F0 11 A0 70
1321:00 8C 6A 15 B9 40 12 99 95
1329:40 03 C8 C0 40 90 F5 60 E5
1331:A0 00 A9 01 8D 6A 15 B9 E6
1339:80 12 99 40 03 C8 C0 40 58
1341:90 F5 60 AD 1E D0 29 01 9B
1349:D0 03 4C 65 08 20 D0 10 EA
1351:20 0A 14 AE 69 15 E0 0A E2
1359:F0 03 4C 65 08 A2 00 BD 21
1361:7F 13 F0 07 20 D2 FF E8 CF
1369:4C 60 13 20 E4 15 A5 C5 BE
1371:C9 19 D0 03 4C 33 08 C9 16
1379:27 D0 F3 4C E2 FC 13 11 EC
1381:11 11 11 11 05 50 4C 41 EA
1389:59 20 41 47 41 49 4E 3F 0C
1391:20 3C 59 2F 4E 3E 00 4E AE
1399:49 43 4B 53 20 00 CE 6B DD
13A1:15 AD 6B 15 C9 FF D0 03 6F
13A9:CE 6C 15 20 31 14 AD 6C 98
13B1:15 D0 0A AD 6B 15 D0 05 09
13B9:A2 00 4C 60 13 4C 62 08 57
13C1:A9 80 8D 12 D4 A9 0F 8D A8
13C9:0E D4 8D 0F D4 A9 29 8D FB
13D1:13 D4 A9 F0 8D 14 D4 A9 0B
13D9:0F 8D 18 D4 A9 81 8D 12 BB
13E1:D4 A9 80 8D 12 D4 60 A9 14
13E9:20 8D 0B D4 A9 0A 8D 07 C9
13F1:D4 8D 08 D4 A9 09 8D 0C CC
13F9:D4 A9 0F 8D 0D D4 A9 21 DF
1401:8D 0B D4 A9 0F 8D 18 D4 9B
1409:60 EE 69 15 A2 18 A0 05 57
1411:18 20 F0 FF A2 00 BD 98 94
1419:13 F0 07 20 D2 FF E8 4C 9E
1421:17 14 AE 69 15 A9 00 20 B5
1429:CD BD A9 20 20 D2 FF 60 8B
1431:A0 10 A2 18 18 20 F0 FF A6
1439:A9 5C 20 D2 FF AD 6C 15 23
1441:AE 6B 15 20 CD BD A9 20 19
1449:20 D2 FF 60 A2 18 A0 19 0C
1451:18 20 F0 FF AE 6D 15 AD AE
1459:6E 15 20 CD BD A9 20 20 D3
1461:D2 FF A2 18 A0 20 18 20 9E
1469:F0 FF AE 6F 15 AD 70 15 2C
1471:20 CD BD A9 20 20 D2 FF 96
1479:60 AD E2 15 F0 06 20 76 41
1481:15 4C 88 14 20 9D 15 4C 87
1489:BB 14 AD E2 15 F0 06 20 11
```

```
1491:9D 15 4C 99 14 20 76 15 14
1499:4C BB 14 AD E3 15 F0 06 8F
14A1:20 AC 15 4C AA 14 20 BB 0E
14A9:15 4C BB 14 AD E3 15 F0 40
14B1:06 20 BB 15 4C BB 14 20 47
14B9:AC 15 AD 6F 15 D0 20 AD 04
14C1:70 15 D0 1B AD 6D 15 D0 51
14C9:16 AD 6E 15 D0 11 20 E4 77
14D1:15 A2 00 BD E8 14 F0 0A 8C
14D9:20 D2 FF E8 4C D4 14 4C 7F
14E1:62 08 A2 00 4C 60 13 13 AE
14E9:11 1F 59 4F 55 20 52 45 97
14F1:41 43 48 45 44 20 53 41 73
14F9:4E 43 55 56 45 52 59 00 50
1501:AD 6E 15 18 6D 70 15 A0 B9
1509:00 AA E0 04 B0 05 A9 02 29
1511:8D 75 15 BD 21 15 99 71 DF
1519:15 C8 E8 C0 04 90 F4 60 D5
1521:1F 0F 07 03 1F 17 0F 13 36
1529:0B 07 03 05 09 11 A2 00 1D
1531:BD 42 15 F0 07 20 D2 FF DA
1539:E8 4C 31 15 A2 02 4C 31 49
1541:15 93 05 50 52 4F 47 52 31
1549:41 4D 20 42 59 20 52 4F CE
1551:42 45 52 54 20 42 49 58 72
1559:42 59 20 00 00 00 00 00 FE
1561:00 00 00 00 00 00 00 00 8B
1569:00 00 00 00 00 00 00 00 93
1571:00 00 00 00 00 AD 6D 15 42
1579:38 E9 0A 8D 6D 15 B0 1B 90
1581:AD 6E 15 38 E9 01 8D 6E 21
1589:15 B0 10 A9 00 8D 6D 15 2D
1591:8D 6E 15 AD E2 15 49 FF 99
1599:8D E2 15 60 AD 6D 15 18 51
15A1:69 0A 8D 6D 15 90 03 EE 6B
15A9:6E 15 60 AD 6F 15 18 69 A0
15B1:0A 8D 6F 15 90 03 EE 70 62
15B9:15 60 AD 6F 15 38 E9 0A 9A
15C1:8D 6F 15 B0 1B AD 70 15 C1
15C9:38 E9 01 8D 70 15 B0 10 CC
15D1:A9 00 8D 6F 15 8D 70 15 4E
15D9:AD E3 15 49 FF 8D E3 15 1E
15E1:60 00 00 78 A9 31 8D 14 05
15E9:03 A9 EA 8D 15 03 58 60 FB
```

BEFORE TYPING . . .

Before typing in programs, please refer to "How to Type In COMPUTE!'s GAZETTE Programs," elsewhere in this issue.

Multicolor Graphics Dump

See instructions in article on page 56 before typing in.

```
C3E8:AD 11 D0 29 20 D0 03 4C CE
C3F0:90 C4 AD 00 DD 29 03 49 8A
C3F8:03 4A 6A 6A 85 04 85 05 D4
C400:AD 18 D0 29 08 F0 06 A5 C8
C408:04 09 20 85 04 AD 18 D0 0A
C410:29 F0 4A 4A 65 05 85 05 A7
C418:4C B6 C4 0D 45 4E 54 45 30
C420:52 20 42 49 54 20 4D 41 B6
C428:50 20 42 4C 4F 43 4B 20 2D
C430:4E 55 4D 42 45 52 20 28 DF
C438:30 2D 37 29 20 00 0D 45 FE
C440:4E 54 45 52 20 43 4F 4C CC
C448:4F 52 20 42 4C 4F 43 4B A7
C450:20 4E 55 4D 42 45 52 20 E8
C458:28 30 2D 36 33 29 20 00 89
C460:FF FF 00 40 EB DF 42 1A 6B
C468:BD E5 5A 1A EF BF 10 40 16
C470:B5 E5 FF BF 4A 1A EB D7 B4
C478:5A 5A 14 20 A5 E5 14 28 5F
C480:4C 48 B2 48 20 CC FF A9 FA
C488:04 20 C3 FF 68 4C 3B A4 24
C490:A9 1B A0 C4 20 1E AB 20 07
C498:9F C6 C9 08 B0 E2 4A 6A 6D
C4A0:6A 6A 85 04 A9 3E A0 C4 37
C4A8:20 1E AB 20 9F C6 C9 40 2D
C4B0:B0 CE 0A 0A 85 05 20 CC 75
C4B8:FF A9 00 20 BD FF A9 04 F3
C4C0:AA A0 00 20 BA FF 20 C0 A0
C4C8:FF B0 B8 A2 04 20 C9 FF F3
C4D0:B0 B1 A9 08 20 D2 FF 20 41
C4D8:8B C6 A9 00 85 6C 85 6D 65
C4E0:85 6A 85 6B A9 00 85 FB 83
C4E8:85 FC 85 66 A9 03 20 E1 07
C4F0:C6 A5 06 85 02 A5 FC 4A 4B
C4F8:A5 FB 6A 85 03 A9 C7 38 80
C500:E5 03 85 03 A9 00 85 63 DB
C508:85 69 A5 03 29 F8 85 67 35
C510:0A 26 69 0A 26 69 65 67 01
C518:90 02 E6 69 0A 26 69 0A A5
C520:26 69 0A 26 69 85 67 A5 92
C528:03 29 07 65 67 85 67 90 67
C530:02 E6 69 A5 02 29 FC 0A B6
C538:26 63 65 67 85 FD A5 69 AB
C540:65 63 65 04 85 FE 78 A5 03
C548:01 48 A9 00 85 01 A0 00 0D
C550:B1 FD 85 65 68 85 01 58 EE
C558:A5 02 29 03 49 03 0A A8 9F
C560:F0 05 46 65 88 D0 FB A9 ED
C568:00 85 63 A5 6C 38 E9 E0 15
C570:A5 6D E9 01 B0 08 A5 65 CD
C578:29 03 85 65 D0 03 4C 0E 99
C580:C6 A9 0C 20 E1 C6 A9 8F 6A
C588:38 E5 FB 85 61 A9 01 E5 1B
C590:FC A0 04 4A 66 61 88 D0 82
C598:FA A5 05 85 69 A5 65 C9 7A
C5A0:03 D0 04 A9 D8 85 69 A9 56
C5A8:00 85 FE A5 61 85 FD 06 F2
C5B0:FD 26 FE 06 FD 26 FE 65 F0
C5B8:FD 85 FD 90 02 E6 FE 06 1D
C5C0:FD 26 FE 06 FD 26 FE 06 A1
C5C8:FD 26 FE A5 FD 65 06 85 2E
C5D0:FD A5 FE 65 69 85 FE A5 FF
C5D8:6C 29 03 85 67 A5 FB 29 90
C5E0:03 85 69 A0 00 B1 FD A6 EF
C5E8:65 E0 01 D0 04 4A 4A 4A B4
C5F0:4A 29 0F 0A 0A 05 69 4A EF
C5F8:A8 B9 60 C4 85 63 A5 69 0E
C600:29 01 0A 0A 05 67 A8 F0 4C
C608:05 46 63 88 D0 FB 46 63 05
C610:66 64 E6 6C D0 02 E6 6D 57
C618:E6 66 A5 66 C9 07 F0 03 1D
C620:4C EC C4 A5 64 38 6A 20 FA
C628:D2 FF 20 E1 FF D0 08 A9 3E
C630:04 20 C3 FF 4C 07 E1 A9 2C
C638:00 85 66 A5 6A A6 6B 85 98
C640:6C 86 6D E6 FB D0 02 E6 CF
C648:FC A5 FB C9 90 D0 06 A5 53
C650:FC C9 01 F0 03 4C EC C4 E5
C658:A9 0D 20 D2 FF 20 8B C6 8D
C660:A5 6A C9 DC F0 16 A5 6A F7
C668:18 69 07 85 6A 90 02 E6 16
C670:6B A5 6A A6 6B 85 6C 86 A5
C678:6D 4C E4 C4 A5 6B C9 01 28
C680:D0 E4 20 CC FF A9 04 20 4F
C688:C3 FF 60 A9 1B 20 D2 FF 9D
C690:A9 10 20 D2 FF A9 00 20 EE
C698:D2 FF A9 1C 4C D2 FF A0 D4
C6A0:00 20 CF FF 99 00 02 C8 C9
C6A8:C9 0D D0 F5 A9 00 99 FF 58
C6B0:01 A9 0D 20 D2 FF A5 7A 29
C6B8:48 A5 7B 48 A9 00 85 7A 9A
C6C0:A9 02 85 7B 20 79 00 20 13
C6C8:8A AD 20 9B BC A5 62 05 0B
C6D0:63 05 64 F0 03 4C 80 C4 FB
C6D8:68 85 7B 68 85 7A A5 65 B8
C6E0:60 85 6F A9 00 85 6E 85 01
C6E8:FE 85 06 A5 6C 85 69 A5 64
C6F0:6D 85 67 D0 0B A5 69 C5 18
C6F8:6F B0 05 A9 00 85 06 60 28
C700:06 6F 26 6E E6 FE A5 67 FF
C708:C5 6E F0 08 B0 F2 90 0C 33
C710:E6 FE B0 0C A5 69 C5 6F 77
C718:F0 F6 B0 E4 46 6E 66 6F 6A
C720:A5 69 38 E5 6F 85 69 A5 4C
C728:67 E5 6E 85 67 90 1A 26 E2
C730:06 06 69 26 67 C6 FE D0 F8
C738:E7 60 A5 69 18 65 6F 85 D9
C740:69 A5 67 65 6E 85 67 B0 3A
C748:E6 26 06 06 69 26 67 C6 6F
C750:FE D0 E7 60 00 00 00 00 96
```

Lava Flow

See instructions in article on page 39 before typing in.

```
C000:20 09 C0 20 DE C0 4C 00 80
C008:C0 A9 00 8D 5E C7 8D 5F B9
C010:C7 A9 05 8D 61 C7 A9 05 DB
C018:8D 62 C7 A9 00 A2 00 9D B4
C020:00 D4 E8 E0 18 D0 F8 A9 A1
C028:0A 8D BF C7 A9 03 8D C0 BB
C030:C7 A9 06 8D 20 D0 8D 21 1A
C038:D0 A9 08 8D 64 C7 8D 63 27
C040:C7 0A 8D 66 C7 8D 65 C7 47
C048:A9 02 8D 6E C7 8D 6F C7 D2
C050:A9 00 8D 70 C7 8D 71 C7 7E
C058:A9 0B 8D 6D C7 AD 0E DC E7
C060:29 FE 8D 0E DC A5 01 29 71
C068:FB 85 01 A9 00 85 FB A9 BB
C070:D0 85 FC A9 00 85 FD A9 B1
C078:30 85 FE A0 00 B1 FB 91 AD
C080:FD A5 FB 18 69 01 85 FB C1
C088:A5 FC 69 00 85 FC A5 FD B2
C090:18 69 01 85 FD A5 FE 69 DE
C098:00 85 FE C9 38 D0 DC A5 5C
C0A0:FD C9 00 D0 D6 A5 01 09 F8
C0A8:04 85 01 AD 0E DC 09 01 7F
C0B0:8D 0E DC AD 18 D0 29 F0 3A
C0B8:18 69 0C 8D 18 D0 A2 00 44
C0C0:BD C2 C7 9D 18 33 E8 E0 E4
C0C8:7A D0 F5 A2 00 BD C2 C7 E8
C0D0:9D 10 33 E8 E0 08 D0 F5 D8
C0D8:A9 28 8D 60 C7 60 20 3F 30
C0E0:C1 20 5D C2 A0 00 AD 62 E5
C0E8:C7 F0 0A AD 61 C7 D0 EE 61
C0F0:A2 05 4C F7 C0 A2 00 BD 5C
C0F8:89 C7 99 94 C7 C8 E8 C0 A1
C100:05 D0 F4 A0 00 A9 91 20 CC
C108:D2 FF A9 0D 20 D2 FF A9 F0
C110:9F 20 D2 FF A2 00 BD 94 EA
C118:C7 CD 93 C7 D0 02 A9 20 E3
C120:29 7F 20 D2 FF E8 E0 27 D5
C128:D0 EC A9 00 85 C6 A5 C6 DD
C130:F0 FC 20 E4 FF C9 59 F0 88
C138:05 C9 4E D0 ED 00 60 A9 61
C140:93 20 D2 FF A9 9F 20 D2 CE
C148:FF A9 27 8D 72 C7 A9 A3 9D
C150:20 D2 FF CE 72 C7 D0 F6 D0
C158:A9 16 8D 72 C7 A9 A2 20 59
C160:D2 FF 20 D2 FF A9 11 20 67
C168:D2 FF A9 9D 20 D2 FF 20 D0
C170:D2 FF CE 72 C7 D0 E6 A9 57
C178:29 8D 72 C7 A9 A3 20 D2 AD
C180:FF CE 72 C7 D0 F6 A9 20 58
C188:A2 07 20 D2 FF CA D0 FA 18
C190:A9 90 20 D2 FF A2 00 BD 86
C198:89 C7 29 7F 20 D2 FF E8 25
C1A0:E0 05 D0 F3 A9 20 20 D2 10
C1A8:FF AD 61 C7 18 69 30 20 27
C1B0:D2 FF A2 0B A9 20 20 D2 83
C1B8:FF CA D0 F8 A9 05 20 D2 0D
C1C0:FF A2 05 BD 89 C7 29 7F A6
C1C8:20 D2 FF E8 E0 0A D0 F3 64
C1D0:A9 20 20 D2 FF AD 62 C7 A5
C1D8:18 69 30 20 D2 FF A0 00 A2
C1E0:A9 E9 8D BB C7 85 FB A9 17
C1E8:05 8D BC C7 85 FC AD BB 9D
C1F0:C7 18 69 15 8D BD C7 AD 7D
C1F8:BC C7 69 00 8D BE C7 A9 9A
C200:69 91 FB A9 6E A0 0A 91 54
C208:FB A0 15 A9 6D 91 FB A0 3B
C210:00 A9 E9 85 FB A9 D9 85 55
C218:FC A9 00 91 FB A0 0A A9 BF
C220:0A 91 FB A0 15 A9 01 91 7B
C228:FB A0 00 A9 00 8D 5E C7 29
C230:8D 86 C7 A9 00 8D 78 C7 A0
```

COMPUTER DIRECT
Is 1st In PRICE, SUPPORT, & GUARANTEE!
WE LOVE OUR CUSTOMERS!

Prices Expire 9-30-88

15 Day Home Trial • 90 Day Immediate Replacement Policy

Complete C64c Commodore System

- Commodore 64c Computer
- Excelerator Plus Disk Drive
- 12" Monochrome Monitor
- Genuine IBM® Printer With Interface And One Roll Of Paper
- GEOS Program For Word Processing & Drawing

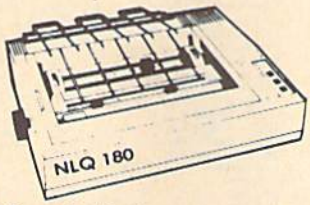
Our Low Sale Price

$395.95

List $825

Hi-Speed NLQ Printer

Lowest Price of 180 CPS Printer Available Anywhere



- High Speed Dot Matrix
- Near Letter Quality Selectable From Front Panel
- Italics - Elite - Condensed - Pica
- Tractor/Friction Feed
- Centronics Parallel Port
- * Lifetime Warranty On Print Head
- 6 Month Replacement Policy For Printer
- Dot Addressable Graphics
- 8K Print Buffer
- Low Cost Adapters Available

Our Low Sale Price

$149.95

List $499

C128D Computer

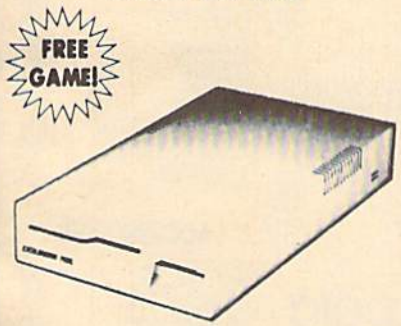
- Full 128 Detached Keyboard
- 1571 Drive With 128K Of User Memory Expandable To 640K
- 3 Operation Modes (C64, C128, & CP/M, Ver. 3.0)
- 40/80 Column Output, 16 colors
- **Free Programmer's Reference Guide**

Our Low Sale Price

$419.95

List $549

Excelerator Disk Drive



- Commodore 1541 Compatible
- Faster than 1541
- 1 Year Limited Warranty

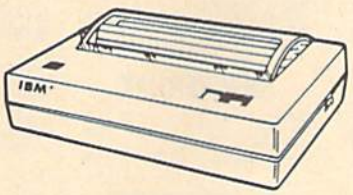
Our Low Sale Price

$139.95

List $249

Genuine IBM® Printer

8½" Letter Size • 80 Column Limited Quantities



- Upper & Lower Case (with true lower descenders)
- Advanced Dot Matrix - Heat Transfer
- Graphics With Commodore, & Apple Interfaces
- Ready to Hook Up To Serial Port Of IBM® PCjr.
- Low Cost Adapters For IBM®, Apple, Commodore, & Laser Computers
- Underline & Enlarged

Our Low Sale Price

$44.95

List $199

5¼" Floppy Disks

Double Sided
Double Density
Minimum Quantity 50
Maximum Quantity 250

19¢ each

Box of 50 ..... $9.50 (19¢ each)
(without sleeves)

Box of 50..... $10.50 (21¢ each)
(with sleeves)

Box of 100 (no limit)... **$24.00 (24¢ each)**
(with sleeves & labels)

100% Certified - Liftetime Guarantee

Economy Sleeves	$1.00 per quantity of 50
Disk Labels	$3.95 per quantity of 100
Disk Notchers	$3.95 each

5¼" Sony Disks

49¢ each

Limited Quantities

Single-Sided, Double Density
Sold In Packages Of 5 With Sleeves, Labels & Write Protects Included
$2.45 Per Box

COMPUTER DIRECT
22292 N. Pepper Rd, Barrington, IL. 60010
Call (312) 382-5050 To Order!

* Illinois residents add 6¼% sales tax. All orders must be in U.S. Dollars. We ship to all points in the U.S., CANADA, PUERTO RICO, & APO-FPO. Please call for charges outside continental U.S. or C.O.D. **MAIL ORDERS** enclose cashier check, money order, or personal check. Allow 14 days delivery, 2 to 7 days for phone orders and 1 day express mail. Prices, specifications & availability subject to change without notice. Shipping - $3.00 minimum, call for exact charges.Shipping and handling charges are not refundable. (Monitors only shipped in continental U.S.) **COMPUTER DIRECT** will match any valid nationally advertised delivered price on the exact same product with a comparable payment method (excluding any applicable sales taxes). A physical copy order of the current valid lower priced ad must be supplied with the order, or within 15 days of date of purchase.

VISA — MASTERCARD — C.O.D.

LET'S FACE IT – MAIL ORDER HOUSES ARE *NOT* ALL THE SAME!

SOFTWARE SUPPORT INTERNATIONAL

CONVENIENCE – FAST SERVICE – RELIABILITY – SUPPORT

Abacus Software

128 Internals (book)	15.36
128 Tricks & Tips (book)	15.36
1571 Internals (book)	15.36
Basic Compiler 64	24.97
Basic Compiler 128	36.97
Becker Basic for Geos	33.97
Cad Pak 64	24.97
Cad Pak 128	36.97
Chart Pak 64	24.97
Chart Pak 128	24.97
Cobol 64	24.97
Cobol 128	36.97
CP/M for the C-128(book)	15.36
Super C Compiler 64	36.97
Super C Compiler 128	36.97
Super Pascal 64	36.97
Super Pascal 128	36.97
Geos Inside & Out Book	15.36
Geos Inside & Out Disk	11.76
Geos Tricks & Tips Book	13.20
Geos Tricks & Tips Disk	11.76

Access Software Incorporated

Echelon w/Lipstick	24.97
LB & Tourn & Exec 1	12.97
Mach 5	21.97
Mach 128	30.97
Tenth Frame	24.97
World Class Leader Board	24.97
W/C L/B Fam/Courses 1	12.97
W/C L/B Fam/Courses 2	12.97
W/C L/B Fam/Courses 3	12.97

Accolade

Apollo 18	18.97
Bubble Ghost	18.97
Card Sharks	18.97
Fast Break	Call
Fourth & Inches	18.97
Hardball	18.97
Miniputt	18.97
Plasmatron	9.97
Power at Sea	18.97
Rack-em	Call
Serve & Volley	Call
Test Drive	18.97
The Train	18.97

ACTIONSOFT

Thunder Chopper	18.97
Up Periscope	18.97

Activision Entertainment Software

Aliens	21.97
Blackjack Academy	24.97
Crossbow	21.97
Faery Tales	30.97
Fire Power	15.97
Gee Bee Air Rally	18.97
Last Ninja	21.97
Maniac Mansion	21.97
Might & Magic	24.97
Might & Magic Hints	10.97
Rampage	21.97
Romantic Encounters	24.97
Sky Travel	30.97

Softworks

Desk Pak I/Font Pak I/Geodex I	31.97
Desk Pak Plus	18.97
Font Pack Plus	18.97
Geos 64	36.97
Geos 128	42.97
GEOSBASIC	Call
Geocalc 64	30.97
Geocalc 128	42.97
Geofile 64	30.97
Geofile 128	42.97
Geoprogrammer 64	42.97
Geoprogrammer 128	42.97
Geopublish 64	30.97
Geospell	18.97
Geowriter's Workshop 64	30.97
Geowriter's Workshop 128	42.97

BOX OFFICE

$100,000 Pyramid	9.95
Alf	9.95
High Rollers	9.95

Broderbund Software

Arcade Game Const. Set	18.97
Bank Street Writer	30.97
Bank Street Filer	18.97
Bank Street Mailer	15.97
Bank Street Speller	15.97
Carmen Sandiego Europe	24.97
Carmen Sandiego USA	24.97
Carmen Sandiego World	21.97
Cauldron 1 & 2	18.97
Magnetron	15.97
Print Shop	27.97
Print Shop Companion	21.97
P/S Graphics Disk 1	15.97
P/S Graphics Disk 2	15.97
P/S Graphics Disk 3	15.97
P/S Holiday Graphics	15.97
Quest for Clues (book)	18.97
Superbike Challenge	12.97

CAPCOM

Ghosts & Goblins	18.97
Hat Trick	18.97
Minigolf	18.97
Side Arms	18.97
1942	18.97

CINEMAWARE

Defender of the Crown	21.97
King of Chicago	21.97
SDI	21.97
Sinbad	21.97
Rocket Ranger	21.97
Three Stooges	21.97
Warp Speed (Cart)	30.97

Data East

Breakthru	18.97
Commando	12.97
Ikari Warriors	18.97
Karate Champ	12.97
Karnov	18.97
Kid Niki	18.97
Kung Fu Master	12.97
Platoon	18.97
Speed Buggy	18.97
Victory Road	18.97

DATASOFT

Alternate Reality:City	19.36
City Hint Book	7.12
Alternate Reality:Dungeon	25.48
Dungeon Hint Book	7.12
Battle Droidz	16.30
Global Commander	19.36
Hunt For Red October	25.48
Rubicon Alliance	13.24
Tobruk	19.36
Video Title Companion 2	13.24
Video Title Shop w/Comp 1	19.36

Digital Solutions Inc.

Dictionary Disk	9.97
Digital Superpak 2	60.97
Pocket Filer 2	36.97
Pocket Planner 2	36.97
Pocket Writer 2	36.97

Electronic Arts

Alien Fires	19.36
Amnesia	25.48
Arctic Fox	21.40
Bard's Tale I	25.48
Bard's Tale I Hints	9.16
Bard's Tale II	25.48
Bard's Tale II Hints	9.16
Bard's Tale III	25.48
Bard's Tale III Hints	9.16
Chessmaster 2000	25.48
Chuck Yeager's AFS	22.42
Dan Dare	13.24
Delta Patrol	13.24
Demon Stalker	19.36
Earth Orbit Station	19.36
Instant Music	19.36
Legacy of the Ancients	19.36
Marble Madness	19.36
Master Ninja	19.36
Mavis Beacon Typing	25.48
Monopoly	19.36
PaperClip 3	31.60
PaperClip Publisher	31.30
Pegasus	19.36
Road Wars	19.36
Rockford	19.36
Scrabble	21.40
Scrupples	25.48
Skate or Die	19.36
Skyfox II	19.36
Strike Fleet	19.36
Twilights Ransom	22.42
Twilights Ransom Hints	7.12
Wasteland	25.48
Wasteland Hints	9.16

EPYX

Arctic Antics	15.97
Battleship	Call
California Games	24.97
Champ. Wrestling	14.97
Create A Calendar	18.97
Death Sword	15.97
Destroyer	24.97
Fast Load Cartridge	24.97
Final Assault	24.97
4 X 4 Racing	24.97
The Games:Summer Edition	Call
The Games:Winter Edition	24.97
Graphic Scrapbook 1	15.97
Graphic Scrapbook 2	15.97
Graphic Scrapbook 3	15.97
Home Video Producer	30.97
Impossible Mission II	24.97
L.A. Crackdown	24.97
Metrocross	12.37
Mind Roll	24.97
Spiderbot	17.16
Sporting News Baseball	24.97
Sports-A-Roni	15.97
Street Cat	12.37
Street Sports:Baseball	24.97
Street Sports:Basketball	24.97
Street Sports:Soccer	24.97
Sub Battle Simulator	24.97
Summer Games II	13.92
Tower Toppler	24.97
Winter Games	12.97
World Games	24.97

Firebird

Advanced Art Studio	24.97
Carrier Command	Call
Elite	11.97
Elite Hint Book (Leroy)	5.77
Guild of Thieves	24.97
Knight Orc	24.97
Jinxter	21.97
Star Glider	24.97
The Sentry	24.97
Tracker	24.97

GAMESTAR

Champ. Baseball	18.97
Champ. Basketball	21.97
GFL Football	21.97
Star Rank Boxing II	18.97
Boxing I/Tennis	18.97

INKWELL

Flexidraw 5.5	24.06
Flexifont	20.76
Graphics Integrator 2	20.76
Light Pen (184C)	40.57
Graphics Gallery 1	20.75
Graphics Gallery 2	20.75

KRACKER JAX

Elite V3.0	6.95
Elite V4.2	14.95
Geobusters V4	9.95
Hacker's Utility Kit	19.95

MICRO PROSE

Airborne Ranger	21.97
F-15 Strike Eagle	21.97
Gunship	21.97
Pirates	24.97
Project Stealth Fighter	24.97
Red Storm Rising	24.97
Silent Service	21.97

Mindscape Inc.

720	21.97
Bad Street Brawler	18.97
Block Buster	18.97
Bop & Wrestle/Infiltrator 2	Call
Captain Blood	21.97
Clubhouse Sports	21.97
Crossword Magic	30.97
Defender of the Crown	21.97
Deja Vu	21.97
Eagles Nest/Infiltrator 1	Call
Gauntlet	21.97
Harrier Combat Simulator	18.97
Indoor Sports	18.97
Indy Jones/Temple of Doom	21.97
Misl Soccer	21.97
Paperboy	21.97
Road Runner	21.97
SuperStar Ice Hockey	21.97
SuperStar Soccer	21.97
Uninvited	21.97
Xevious	18.97

ORIGIN

Autoduel	33.36
Moebius	26.88
Ogre	20.40
Ultima 1	26.88
Ultima 3	26.88
Ultima 4	39.84
Ultima 5	39.84

PROFESSIONAL

Professional Software Inc.

Fleet Filer 64/128	24.97
Fleet System 2+ +	36.97
Fleet System 4	48.97

SSI

Strategic Simulations Inc

Eternal Dagger	24.97
Gemstone Healer	18.97
Gemstone Warrior	9.97
Heroes of the Lance	19.36
Phantasie I	24.97
Phantasie II	24.97
Phantasie III	24.97
Pool of Radiance	25.48
Questron I	24.97
Questron II	24.97
Realms of Darkness	24.97
Rings of Zilfin	24.97
Shard of Spring	24.97
Wargame Construction Set	18.97
Wizard's Crown	24.97

SHAREDATA

Concentration	9.95
Family Feud	9.95
High Rollers	9.95
Jeopardy	9.95
Jeopard Jr.	9.95
Wheel Of Fortune	9.95
Wheel of Fortune 2	9.95
Card Sharks	9.95

SOLUTIONS UNLIMITED

Billboard Maker	24.97
Grafix Link	12.97
Icon Factory	24.97
Photo Finish	18.97
Screen F/X	21.97

SPRINGBOARD

Certificate Maker	26.88
Certificate Maker Libr.I	20.40
Newsroom	33.36
Newsroom Clipart 1	20.40
Newsroom Clipart 2	26.88
Newsroom Clipart 3	20.40
P/S Graphic Expander	23.64

subLOGIC

Flight Simulator II	33.97
Flight Sim Scenery 1	14.16
Flight Sim Scenery 2	14.16
Flight Sim Scenery 3	14.16
Flight Sim Scenery 4	14.16
Flight Sim Scenery 5	14.16
Flight Sim Scenery 6	14.16
Flight Sim Scenery 7	17.46
Flight Sim Scenery 11	17.46
Flight Sim Scenery 14	17.46
Flight Sim Scenery Japan	17.46
Flight Sim Scenery SanFran	17.46
Jet 2	27.36
Stealth Mission	33.96

THE WORKS

Accounts Payable	33.36
Accounts Receivable	33.36
Data Manager 2	17.16
Data Manager 128	33.36
Desktop Publisher	39.84
Electronic Checkbook	13.92
General Ledger	33.36
Inventory Management	33.36
Partner 64	33.36
Partner 128	39.84
Payroll Management	33.36
Swiftcalc/Sideways 64	17.16
Swiftcalc/Sideways 128	33.36
Sylvia Porter F/P 64	33.36
Sylvia Porter F/P 128	46.32
Word Writer 3	33.36
Word Writer 128	33.36

THE WORKS

UNISON WORLD INCORPORATED

Art Gallery 1	15.97
Art Gallery 2	15.97
Art Gallery 4 Amer Hist	Call
Art Gallery 3	15.97
Printmaster Plus	21.97

MISCELLANEOUS

Art Worx/Bridge 5.0	21.97
Assembly for Kids (book)	11.76
Avalon Hill NBA Basketball	24.97
Basic 8	29.95
Beginner's Guide/Basic 8	19.95
Big Blue Reader 128/CP/M	27.97
Bob's Term Pro 64	30.97
Bob's Term Pro 128	36.97
Easy Working Triple Pak	12.97
B/W Business Form Shop	24.97
B/W Geos Word Publisher	24.97
CDA Graphic Transformers	21.97
Club Backgammon	20.40
CSM Drive Align Kit	30.12
CSM Protection Manual I	22.55
CSM Protection Manual II	26.15
Dark Castle (3-60)	21.97
Doodle	24.97
Flexfile 128	30.97
Font Master 2	30.97
Font Master 128	36.97
Geneology:Family Tree 64	36.97
Geneology:Family Tree 128	36.97
Geos Companion 1	18.97
Hes Mon 64 (cart)	9.95
IHT/CAD 3D	30.97
Konami:Contra	18.97
Konami:Rush'N Attack	18.97
Konami:Yie Ar-Kung Fu 2	18.97
Merlin Assembler 64	30.97
Merlin Assembler 128	42.97
Microlawyer	36.97
Microleague WWF Wrestling	24.95
Paul Whitehead Chess	21.97
Sam's/C-64 Prog. Base Ref. Guide	15.36
Softsync Pers. Newsletter	36.97
Strip Poker	18.97
Poker Data Disk 1	12.97
Poker Data Disk 2	12.97
Poker Data Disk 3	12.97
Star Empire	15.97
Superbase 64	48.97
Superbase 128	48.97
Superbase the Book	12.48
Super Sunday	23.64
Superscript 64	30.97
Superscript 128	42.97
Tab Books/Adv 128 Grap/Snd	12.48
Tab Books/C64 Trouble Shoot	13.20
Tab Books/C64 Serious Prog	8.88
Vampire's Empire	18.97
Wizardry/Sir Tech	24.97

ACCESSORIES

1541/71 Serial Cable	4.95
1541/71 Power Cable	4.95
Anti-Static Touch Strip	8.95
C-128 RGB Monitor Cable	5.95
C-64 Color Monitor Cord	4.95
C-64 Repairable Power Supply	39.95
RS-232 Interface	36.95
MW 350 Printer Interface	49.95
Aprospand 64	27.95
Aprospand Extender Cable	15.95
Aprotek 1200 Baud Minimodem	79.95
Commodore 1351 Mouse	37.95
Mouse Mat	8.95
1541 Dust Cover	8.95
1571 Dust Cover	8.95
C-64 Dust Cover	8.95
C-64C Dust Cover	8.95
C-128 Dust Cover	8.95
Disk Notcher-Square Cut	4.95
5.25" Disk Drive Cleaner	5.95
3.5" Disk Drive Cleaner	6.95
10 Cnt Disk Storage	1.95
50 Cnt Disk Storage	8.95
100 Cnt Disk Storage w/Lock	12.95
80 Cnt 3.5" Disk Stor. w/Lock	9.95
3.5" Disk Labels-25 cnt	1.00
5.25" Disk Labels-96 cnt	1.00
3.5" DS/DD Diskettes	1.29
5.25" DS/DD Diskettes-Black	.39
5.25" DS/DD Diskettes-10 colors	.79
Write Protects-100 cnt Black	1.00
Tyvek Sleeves-High Quality	ea .09
Silk Stik-Joystick	6.95
Quick Shot II-Joystick	7.95
Tac 2-Joystick	10.95
Tac 3-Joystick	11.95
Suncom Icon Troller	17.95
Surge Protector/Power Pad	39.95

MANY OTHER C-64/128 TITLES AVAILABLE — CALL FOR PRICES!

ALL NEW

ATTENTION C-128 OWNERS

Now that Commodore has released the C-128D with 64K of video RAM, we should be seeing 128 programs address this fantastic new feature soon.

BASIC 8 already has the capability of using all 64K of video RAM. If you own the C-128 in stock condition, you own all 16K of video RAM that Commodore felt was necessary. Using Basic 8 format and the full 64K of video RAM provides you with the ability to scroll through video memory as well as enhanced color resolution.

Up until now, to upgrade the C-128 to 64K of video RAM you would have to first search out the components, then find a competent repair outlet to desolder and install the parts. **What a hassle!**

SOLUTION — We have developed a module that simply plugs in to the mother board of your C-128. **No splattered solder — No heat damage — No hassle.**

This package includes full easy to follow installation instructions, a test program to validate proper installation and the plug-in upgrade module.

ONLY **$34.95**

ALL NEW

RENEGADE

ALL NEW

Project Phoenix. We assembled a team of the hottest archival programmers in the industry and gave them the challenge of their carreers: create a professional utility system that would set the tone for the future of Commodore personal computing - a system for the next decade and beyond.

Hundreds of expert-hours later, that team delivered to us a utility package of sobering power and scope. A package that could turn an average hacker into a superstar. A package created at the very boundary between what is and is not possible. A package called Renegade.

Renegade takes the very best ideas from the past and re-creates them, combining state of the art techniques with a conceptual grasp of the future of computing. The result is dynamic - classic utilities are transformed into muscular components of a system designed for speed, power, and flexibility.

Here are Some of the Features Built Into The RENEGADE!

- ★ Single or Dual High Speed Data Copier
- ★ Single or Dual State of the Art Nibbler
- ★ Directory Editor: Organize your Disks
- ★ GCR Editor: For the Experienced Hacker
- ★ Geos™ Modual: PARAMETERS and TOOLS
- ★ 200 Parms: For those tough to backup disks
- ★ New Parameter updates only $9.95 each
- ★ Compatable with C-64-128 with 1541/71 Drives
- ★ Single or Dual Ultra Fast File Copier
- ★ Capable of Archiving RapidLok Protection
- ★ Scrolling M/L Monitor with Drive Mon
- ★ Error Scanner with Unique Sector Editor
- ★ Byte Pattern Scanner: High Speed Searches
- ★ Upgradable Sub Menu: New tools in the works
- ★ Major RENEGADE upgrades only $9.95 each
- ★ Technical support available: of course

Renegade comes with over 250 parameters, and additional parameters are available every 2 months! Also, Renegade program updates are available to registered owners 3 times a year to ensure that Renegade will always be a step ahead of anything else on the market!

Now nothing can stop you from taking TOTAL control of your software! Renegade gives you the most advanced tools on the market for one remarkably low price. And, unlike some companies that claim to sell utilities unlimited in power, Renegade is produced by a company that knows that the customer is our most valuable asset.

Renegade: Next generation software - for the next generation hacker.

ATTENTION: REGISTERED RENEGADE OWNERS!
Parameter Module #2 is now available, Only $9.95

RENEGADE **Only $34.95**

AMIGA AMIGA AMIGA AMIGA

AMIGA SOFTWARE

4x4 Off Road Racing	24.97
Arkanoids	18.97
Awesom Arcade Pak	30.97
Barbarian	24.97
Bard's Tale	30.97
Bubble Ghost	24.97
California Games	24.97
Captain Blood	30.97
Deluxe Paint II	79.97
Digipaint	36.97
Digiview	134.97
Dive Bomber	24.97
Earl Weaver Baseball	30.97
Faery Tale	30.97
Fire Power	15.97
Flight Simulator II	33.97
Flight Sim Scenery #7	17.97
Flight Sim Scenery #11	17.97
FA/18 Interceptor	30.97
Heros of the Lance	25.97
Kindwords	60.97
Land of Legends	30.97
Leaderboard Golf	27.97
Leaderboard F/C #1	13.97
Maxiplan 500	109.95
Microfiche Filer	60.97
Money Mentor	59.97
Obliterator	24.97
Paladin	24.97
Phantasie	26.97
Phantasie III	26.97
Printmaster Plus	30.97
Printmaster Art Gallery #1	21.97
Printmaster Art Gallery #2	21.97
Printmaster Art Gallery #3	18.97
Printmaster Fonts/Borders	21.97
Road Wars	21.97
Rocket Ranger	30.97
Rockford	21.97
Sculpt 3D	66.97
Shadowgate	30.97
Strip Poker	24.97
Strip Poker Data Disk #4	13.97
Strip Poker Data Disk #5	13.97
Test Drive	27.97
The Director	42.97
Three Stooges	30.97
Time Bandit	24.97
Turbo	15.97
Uninvited	30.97
Vampire's Empire	21.97
Zoom	18.97

AMIGA AMIGA AMIGA AMIGA

GRAPHIC LABEL WIZARD

You will be delighted with this flexible and powerful tool. Without a doubt, the Graphic Label Wizard is the hottest label program around.

- ★ Print a graphic and up to 8 lines of text on a standard mailing label!
- ★ High Res display allows load and preview of up to four graphics!
- ★ Save created labels on disk for later recall, modification and printing!
- ★ Print catalogs of your Printmaster or Printshop compatable graphics!
- ★ Works with Epson compatible, and Commodore 1525, 801, 803 compatable printers!
- ★ Print text in any style your printer supports: Italic, Bold, Expanded!
- ★ Program disk includes exciting new graphics!
- ★ FREE BONUS: 100 NEW graphics created by Software Solutions! A SUPER C-64 Utility from the people who brought you SuperCat!

ONLY $24.95

SYSRES™ ENHANCED

The best — we mean the Best Basic enhancement system for the C-64

- ★ Adds over 25 major commands to Basic
- ★ Extended Super DOS-Wedge
- ★ Scrolling thru Basic
- ★ Renumber, Trace, Search, and many other features
- ★ 1541/71 fast loader included
- ★ M/L monitor from Basic
- ★ Transferable to 1581

ONLY $39.95

SuperCat

Tired of searching endlessly through your disks to find the one title you're interested in? Frustrated by catalog programs that run out of memory or storage space every time your disk library grows?

Then now is the time to invest in SuperCat, the most sophisticated disk cataloging system available today for your Commodore C-64!

- ★ Catalog up to 640 disks and 5000 titles per disk!
- ★ Accepts disks with duplicate ID's
- ★ Reads titles from the directory of the disks to be cataloged.
- ★ Allows custom editing of titles being catsloged!
- ★ Prints a large variety of reports, even creates labels for your disks!
- ★ Operates with one or two 1541/1571 disk drives!

Find out why Ahoy! Magazine in the Feb. 1987 issue, gave high praises to this powerfull utility. SuperCat - A CLASSIC!

Only $24.95

C-128 CANNON

THE TOTAL COPY/UTILITIES PACKAGE CREATED JUST FOR C-128 OWNERS!

- ★ The Nibbler: Powerful! Works with single or dual 1541/1571 drives!
- ★ Fast Copier: For backing up data disks or for use with Kracker Jax!
- ★ File Copier: File transfers between 1541/1581/1571 drives!
- ★ 1581 Fast Copier: Copies from one 3.5" disk to another-1 or 2 drives!
- ★ MFM Copier: Copy unprotected IBM or CP/M formats-on 1571 drive!
- ★ Track & Sector Editor: 1541/1571 and even 1581 compatable!
- ★ Error Scanner: Full featured error scanner with on-screen display!
- ★ Density Scanner: Allows check for altered densities track by track!
- ★ Directory Editor: Reorganize the directories on your 5.25" disks!
- ★ Kracker Jax: 100 of our hottest, most popular parameters!
- ★ SPECIAL BONUS: Elite V3 for backups of Pocket 2 Series-FREE!

Your Commodore 128 deserves the best, so why not get the best!

ONLY $34.95

ALL NEW

Introducing the 1541 RAMBOard

Copy protection's "worst nightmare"

The dream has been there for years now: an inexpensive piece of hardware that, when added to your system, would allow you to backup almost every single piece of software ever released for the C64.

Software Support has just made the dream a reality!

We're proud to introduce the 1541 RAMBOard, a small card that can easily be installed into your 1541/1541C disk drive in 5 minutes using just a screwdriver. With this powerful card in place, backup hassles are a thing of the past! Working with special software, the RAMBOard will backup software that other utilities can't even scratch the surface of. And as new protection schemes arrive, we'll create new parameters to keep your RAMBOard operating behind enemy lines.

RAMBOard also comes bundled with a fast copier that can archive an unprotected data disk in under 50 seconds!

The concepts behind "card" systems are public domain. So why should you have to pay $44.95 or more for someone else's "card"? Software Support will sell you the hardware* for just $26.95!!! So if you don't have an unlimited income, don't worry. Just order your new RAMBOard from Software Support -- the company that's declared war on high prices.

RAMBOard -- Our Price: $26.95

Other companies "card" boards: $44.95 or more.

*The 1541 RAMBOard requires software to operate. This software can be either RAMBOard parameters, soon to be found on our Renegade program disk, or any of the other "card" software already on the market.

KRACKER KAX REVEALED I & II

Our knowledge of protection schemes has made us famous. Now find out how we do what we do best. Our books are your key to REAL knowledge. OTHERS ONLY GIVE SURFACE INFO - We dig deep, much deeper. Let us show you the ins and outs of todays copy protection. These books are a must for all serious Commodore users.

REVEALED BOOK I with Reset Button $23.50

REVEALED BOOK II with Hesmon Cartridge $23.50

REVEALED BOOK III COMING THIS FALL!!

FLASH! Kracker Jax Earns a 5 Star Rating In INFO's May-June '88 Issue

Kracker Jax is the powerful parameter based copying system that has taken the country by storm! What IS a parameter? It's a custom program that allows your 1541 or 1571 disk drive to strip ALL copy protection from your expensive software, leaving you with UNPROTECTED, TOTALLY BROKEN BACKUPS that can even be copied with a simple fast copier!

We declare **Kracker Jax** to be the best system of its kind on the market today! A bold claim? Maybe.

But don't take our word for it—if you want the REAL story on how good **Kracker Jax** is just ask one of our customers. Don't worry. You won't have any problem finding one.

Vols 1-2-3-4 **Only $9.95 ea.**
Vols 5-6-7 **Still Only $19.95 ea.**

SOFTWARE SUPPORT INTERNATIONAL

Ordering is simple: We accept money orders, certified checks, personal checks (of previous Software Support customers), VISA, M/C, Discover, and COD. Orders shipped to U.S.A., F.P.O., A.P.O., Canada, or Mexico, please add $3.00 per order for shipping and handling. COD available to U.S. customers only: add $2.25 additional per order. Foreign customers must call or write for exact shipping charges. Defective items are replaced at no charge IF and only IF you call for a Return Authorization Number. All in stock orders are processed within 24 hours. U.S. Shipping is by UPS ground in most cases. FAST 2nd DAY AIR available: add $1.00 per pound additional (U.S. 48 states only). U.S. software orders over 100 dollars will be shipped 2nd Day Air at our regular $3.00 S/H charge. Washington residents please add 7.5% additional for Sales Tax. All prices subject to change.

Program Submissions Invited
Need more info? Call or write for our free catalog.

Mail your order to: Software Support Int.
2700 NE Andresen Road / Vancouver, WA 98661

Or call our toll-free order line at 1-800-356-1179, 9am-5pm Pacific time Monday-Friday.
After hours orders accepted at (206) 695-9648 7 days a week.
Technical support available. Call (206) 695-9648, 9am-5pm Pacific time, Monday-Friday.

VISA MasterCard DISCOVER

DEALERS — WE HAVE THE SUPPORT YOU'RE LOOKING FOR!

```
C238:A9 04 8D 79 C7 A9 00 8D 4F
C240:7A C7 8D 70 C7 8D 71 C7 CC
C248:A9 06 8D 69 C7 8D 67 C7 77
C250:8D 68 C7 8D 6A C7 8D 6B 81
C258:C7 8D 6C C7 60 CE 67 C7 04
C260:D0 09 AD 6A C7 8D 67 C7 F7
C268:20 B6 C2 CE 68 C7 D0 09 FD
C270:AD 6B C7 8D 68 C7 20 E0 FC
C278:C2 AD 5E C7 F0 03 4C 8F CE
C280:C2 20 0A C3 20 0D C7 20 D1
C288:51 C7 AD 5E C7 F0 CE 20 04
C290:7C C6 A9 FF 85 FB C6 FC E1
C298:D0 FC 20 7C C6 20 7C C6 08
C2A0:C6 FB D0 F2 20 51 C7 20 C7
C2A8:51 C7 20 51 C7 20 51 C7 0B
C2B0:A9 00 8D 04 D4 60 AD 00 80
C2B8:DC 8D 73 C7 AD BB C7 8D 74
C2C0:74 C7 AD BC C7 8D 75 C7 1B
C2C8:A9 00 8D 7E C7 8D 81 C7 FB
C2D0:20 C0 C4 AD 74 C7 8D BB A3
C2D8:C7 AD 75 C7 8D BC C7 60 28
C2E0:AD 01 DC 8D 73 C7 AD BD C5
C2E8:C7 8D 74 C7 AD BE C7 8D 46
C2F0:75 C7 A9 01 8D 7E C7 8D EB
C2F8:81 C7 20 C0 C4 AD 74 C7 CE
C300:8D BD C7 AD 75 C7 8D BE 36
C308:C7 60 A9 0F 8D 7B C7 A0 3C
C310:00 AD BF C7 8D 7E C7 AD 1B
C318:78 C7 85 FB 18 69 D0 85 CB
C320:FD AD 79 C7 85 FC 69 07 B7
C328:85 FE B1 FB C9 65 F0 0D FA
C330:18 C9 6E F0 05 B0 03 4C 50
C338:E2 C3 4C 84 C3 CE 6F C7 F3
C340:F0 03 4C E2 C3 AD 6E C7 32
C348:8D 6F C7 A5 FB 18 69 00 D8
C350:85 FD A5 FC 69 D4 85 FE 47
C358:B1 FD 29 0F CD C0 C7 D0 20
C360:03 4C E2 C3 C9 02 F0 0B 58
C368:C9 08 F0 0C C9 09 F0 0D 17
C370:4C AB C3 A9 08 4C 7F C3 50
C378:A9 0A 4C 7F C3 A9 02 91 33
C380:FD 4C E2 C3 B1 FD F0 02 1C
C388:A9 01 CD 7A C7 F0 03 4C DA
C390:E2 C3 AD 7A C7 F0 05 A9 8D
C398:00 4C 9E C3 A9 01 91 FD B5
C3A0:CE 6F C7 D0 EA AD 6E C7 24
C3A8:8D 6F C7 A9 64 91 FB AD 75
C3B0:BF C7 20 97 C4 A5 FB 38 74
C3B8:E9 28 85 FB A5 FC E9 00 A4
C3C0:85 FC A9 6D 8D 7E C7 20 6C
C3C8:2A C4 A9 27 20 B4 C4 20 BB
C3D0:2A C4 A9 02 20 B4 C4 20 71
C3D8:2A C4 A9 27 20 B4 C4 20 CB
C3E0:2A C4 CE 7B C7 D0 01 60 24
C3E8:AD 78 C7 18 69 01 8D 78 C2
C3F0:C7 AD 79 C7 69 00 8D 79 53
C3F8:C7 C9 07 D0 2A AD 78 C7 85
C400:C9 E8 D0 23 A9 00 8D 78 D5
C408:C7 A9 04 8D 79 C7 CE 6E 30
C410:C7 D0 05 A9 03 8D 6E C7 DF
C418:EE 7A C7 AD 7A C7 C9 02 14
C420:D0 05 A9 00 8D 7A C7 4C BA
C428:0F C3 EE 7E C7 B1 FB C9 B6
C430:20 F0 16 C9 65 F0 15 18 96
C438:C9 64 F0 0C 90 0A 18 C9 45
C440:6E F0 05 B0 03 4C 4F C4 95
C448:60 4C 6B C4 4C 91 C4 AD AE
C450:BF C7 20 97 C4 AD 80 C7 CE
C458:C9 01 F0 06 CE 61 C7 4C 5D
C460:65 C4 CE 62 C7 A9 01 8D 42
C468:5E C7 60 AD 7E C7 91 FB 2C
C470:A9 0A 20 97 C4 A5 FB 18 9B
C478:69 D0 85 FD A5 FC 69 07 76
C480:85 FE AD 7A C7 F0 05 A9 9F
C488:00 4C 8E C4 A9 01 91 FD B5
C490:60 A9 09 20 97 C4 60 8D F5
C498:7F C7 A5 FB 18 69 00 85 34
C4A0:FD A5 FC 69 D4 85 FE B1 35
C4A8:FD 29 0F 8D 80 C7 AD 7F 34
C4B0:C7 91 FD 60 18 65 FB 85 1C
C4B8:FB A5 FC 69 00 85 FC 60 50
C4C0:AD 74 C7 85 FB AD 75 C7 D8
C4C8:85 FC A0 00 B1 FB 38 E9 40
C4D0:65 8D 83 C7 A9 00 8D 85 4B
C4D8:C7 AD 73 C7 29 01 D0 05 90
C4E0:A9 02 4C 09 C5 AD 73 C7 6D
C4E8:29 08 D0 05 A9 04 4C 09 72
C4F0:C5 AD 73 C7 29 02 D0 05 AB
C4F8:A9 06 4C 09 C5 AD 73 C7 86
C500:29 04 D0 5B A9 08 4C 09 FF
C508:C5 8D 83 C7 A9 00 8D 85 B4
C510:C7 20 BE C5 C9 00 D0 1D C8
C518:AD 84 C7 8D 85 C7 A5 FB FF
C520:8D 74 C7 A5 FC 8D 75 C7 B3
C528:A0 00 A9 65 18 6D 83 C7 D4
C530:91 FB 4C 5F C5 C9 01 D0 2B
C538:26 A9 01 8D 5E C7 A5 FB 93
C540:18 69 00 85 FD A5 FC 69 74
C548:D4 85 FE A0 00 AD BF C7 87
C550:91 FD AD 7E C7 F0 04 CE 9A
C558:62 C7 60 CE 61 C7 60 AD 98
C560:73 C7 29 10 F0 01 60 AD B7
C568:7E C7 F0 29 20 E9 C6 AD B9
C570:71 C7 F0 10 AD 6C C7 8D 02
C578:6B C7 A9 14 8D 68 C7 A9 69
C580:00 4C 91 C5 AD 6D C7 8D ED
C588:6B C7 A9 14 8D 68 C7 A9 79
C590:01 8D 71 C7 60 20 C5 C6 80
C598:AD 70 C7 F0 10 AD 6C C7 F6
C5A0:8D 6A C7 A9 14 8D 67 C7 8E
C5A8:A9 00 4C BA C5 AD 6D C7 C5
C5B0:8D 6A C7 A9 14 8D 67 C7 9E
C5B8:A9 01 8D 70 C7 60 A9 00 25
C5C0:8D 84 C7 AD 83 C7 C9 02 D8
C5C8:F0 0B C9 04 F0 0F C9 06 66
C5D0:F0 13 4C ED C5 A9 28 20 47
C5D8:6A C6 4C F5 C5 A9 01 20 2B
C5E0:58 C6 4C F5 C5 A9 28 20 78
C5E8:58 C6 4C F5 C5 A9 01 20 32
C5F0:6A C6 4C F5 C5 A0 00 B1 AE
C5F8:FD C9 20 F0 11 C9 64 F0 72
C600:0A 18 C9 6E F0 05 B0 03 B8
C608:A9 02 60 A9 01 60 B1 FB 7A
C610:91 FD AD 7E C7 F0 06 AD 3F
C618:71 C7 4C 20 C6 AD 70 C7 71
C620:C9 00 F0 05 A9 65 4C 2B A7
C628:C6 A9 20 91 FB A5 FB 18 27
C630:69 00 85 FB A5 FC 69 D4 AB
C638:85 FC AD C0 C7 91 FB A5 AB
C640:FD 85 FB 18 69 00 85 FD 83
C648:A5 FE 85 FC 69 D4 85 FE 91
C650:AD 7E C7 91 FD A9 00 60 5D
C658:8D 72 C7 A5 FB 18 6D 72 2A
C660:C7 85 FD A5 FC 69 00 85 60
C668:FE 60 8D 72 C7 A5 FB 38 6B
C670:ED 72 C7 85 FD A5 FC E9 4D
C678:00 85 FE 60 A9 00 8D 04 B9
C680:D4 A9 76 8D 05 D4 A9 28 81
C688:8D 06 D4 A9 64 8D 00 D4 C1
C690:A9 8E 8D 01 D4 A9 0F 8D 51
C698:18 D4 A9 81 8D 04 D4 60 3B
C6A0:A9 00 8D 12 D4 A9 26 8D FC
C6A8:13 D4 A9 06 8D 14 D4 A9 9A
C6B0:12 8D 0E D4 AD 88 C7 8D 66
C6B8:0F D4 A9 05 8D 18 D4 A9 A8
C6C0:21 8D 12 D4 60 A9 00 8D 09
C6C8:0B D4 A9 76 8D 0C D4 A9 9D
C6D0:0F 8D 0D D4 A9 0E 8D 07 DF
C6D8:D4 A9 0B 8D 08 D4 A9 0F 6B
C6E0:8D 18 D4 A9 81 8D 0B D4 9D
C6E8:60 A9 00 8D 0B D4 A9 76 5F
C6F0:8D 0C D4 A9 0F 8D 0D D4 1B
C6F8:A9 0E 8D 07 D4 A9 0D 8D F5
C700:08 D4 A9 0F 8D 18 D4 A9 0F
C708:81 8D 0B D4 60 CE 63 C7 37
C710:F0 01 60 AD 64 C7 8D 63 FF
C718:C7 AD 20 33 C9 33 F0 0C 37
C720:A9 04 8D 88 C7 A2 CC A9 CB
C728:33 4C 35 C7 A9 02 8D 88 80
C730:C7 A2 33 A9 CC 8D 20 33 5D
C738:8D 21 33 8E 22 33 8E 23 44
C740:33 8D 24 33 8D 25 33 8E 7A
C748:26 33 8E 27 33 20 A0 C6 1E
C750:60 AE 60 C7 AC 60 C7 88 43
C758:D0 FD CA D0 F7 60 00 00 77
C760:00 00 00 00 00 00 00 00 EF
C768:00 00 00 00 00 00 00 00 F7
C770:00 00 00 00 00 00 00 00 FF
C778:00 00 00 00 00 00 00 00 08
C780:00 00 00 00 00 00 00 00 10
C788:00 C2 CC C1 C3 CB D7 C8 44
C790:C9 D4 C5 BA BF BF BF BF DA
C798:BF BA D0 CC C1 D9 C5 D2 71
C7A0:BA D7 CF CE A1 BA BA BA 92
C7A8:BA BA D0 CC C1 D9 BA C1 D7
C7B0:C7 C1 C9 CE BA A8 D9 AD 94
C7B8:CE A9 BF 00 00 00 00 00 12
C7C0:00 00 FF C3 A5 99 99 A5 F8
C7C8:C3 FF FF FF FF FF FF FF 3A
C7D0:FF FF FF C0 C0 C0 FF 0C 81
C7D8:0C 0C 80 98 58 3C 1A 28 1B
C7E0:44 22 42 5A 5A 3C 18 18 15
C7E8:24 24 01 19 1A 3C 58 14 CB
C7F0:22 44 00 18 18 3F 58 18 AA
C7F8:24 48 00 18 18 3C 5A 19 AD
C800:24 48 00 18 18 3C 5A 3C D9
C808:18 3C 00 18 18 3C 5A 98 35
C810:24 12 00 18 18 FC 1A 28 CA
C818:24 12 00 00 00 18 28 56 47
C820:6A B5 01 07 0B 15 1B 05 CC
C828:07 01 80 E0 D0 A8 B0 D0 F6
C830:E0 80 AB 56 6A 2C 10 00 51
C838:00 00 00 00 00 00 00 00 C9
```

MultiSort

Article on page 66.

Program 1: Sort Maker

```
HE 10 REM COPYRIGHT 1988 COMPU
      TE! PUBLICATIONS, INC. -
       ALL RIGHTS RESERVED
EM 20 PRINT"{CLR}{3 SPACES}COP
      YRIGHT 1988 COMPUTE! PUB
      ., INC.":PRINTTAB(11)"AL
      L RIGHTS RESERVED"
FF 30 POKE48,9:POKE50,9:CLR:RE
      M MUST MOVE VARIABLES UP
GM 40 BANK0:FORX=6912TO7057:RE
      ADZ:T=T+Z:POKEX,Z:NEXT:I
      FT<>14749THEN110
RM 50 BANK1:FORX=1024TO2036:RE
      ADZ:T=T+Z:POKEX,Z:NEXT:I
      FT<>113337THEN110
FM 60 BSAVE"%SORT0",B0,P6912 T
      O P7058:PRINT"SORT0: "DS
      $
PD 70 BSAVE"%SORT1",B1,P1024 T
      O P2037:PRINT"SORT1: "DS
      $
MA 80 INPUT"SAVE TO ANOTHER DI
      SK (Y/N)";A$
GE 90 IF LEFT$(A$,1)<>"Y"THEN
      {SPACE}END
KX 100 PRINT"INSERT DISK AND P
       RESS ANY KEY":GETKEYA$:
       GOTO60
CJ 110 PRINT"ERROR IN DATA STA
       TEMENTS..."
GC 120 DATA 32,134,3,201,58,24
       0,3,76,108,121,32,128,3
       ,32,60,123,144,245
BC 130 DATA 133,5,32,128,3,144
       ,15,201,36,208,6,169,12
       8,133,6,208,23,32
PH 140 DATA 60,123,144,223,9,1
       28,133,6,32,128,3,144,2
       51,32,60,123,176
QF 150 DATA 246,201,36,208,205
       ,32,128,3,201,40,208,19
       8,32,215,119,32
XK 160 DATA 199,140,240,4,201,
       58,208,186,162,10,189,1
       36,27,157,128,2
GA 170 DATA 202,16,247,32,128,
       2,176,3,169,0,96,169,0,
       141,0,255,138,208
PE 180 DATA 10,32,125,255,69,7
       7,80,84,89,32,0,32,125,
```

MONTGOMERY GRANT

Warehouse address: 33 34th Street, Brooklyn, N.Y. 11232

OUTSIDE USA----*CALL*
(718)692-0071
FOR CUSTOMER SERVICE
Call Mon-Fri: 9:30am-5pm
(718)692-1148

FOR ORDERS & INFORMATION
CALL TOLL FREE
1-800-759-6565

OR WRITE TO:
Montgomery Grant
P.O. Box 58 Brooklyn,NY 11230
FAX NO. 7186923372
TELEX NO. 422132HMOLLER

OPEN 7 DAYS A WEEK FOR ORDERS: Monday-Friday 9:00am-7:30pm Saturday & Sunday 9:30am-6pm (EDT)

NO SURCHARGE FOR CREDIT CARD ORDERS

WE INVITE CORPORATE & EDUCATIONAL CUSTOMERS

commodore

C128

COMPUTER PACKAGES

#1 COMPLETE PACKAGE
COMMODORE 128 COMPUTER
COMMODORE 1541 DISK DRIVE
12" MONITOR
COMMODORE PRINTER
BOX OF 10 DISKETTES
DISK DRIVE HEAD CLEANER
GAME DISK

$399 COLOR MONITOR ADD *$90*

TO SUBSTITUTE 1571 FOR 1541 - ADD$60

#2 DELUXE PACKAGE
COMMODORE 128 COMPUTER
COMMODORE 1571 DISK DRIVE
COMMODORE 1902 RGB COLOR MONITOR
COMMODORE 1515 80 COL. PRINTER
BOX OF 10 DISKETTES
DISK DRIVE HEAD CLEANER
GAME DISK

$639

SPECIAL!
C-128/D DELUXE PACKAGE
C-128 COMPUTER W/ BUILT-IN DISK·1902 RGB COLOR MONITOR · COMMODORE COLOR PRINTER

$639

C64C

COMPUTER PACKAGES

#3 COMPLETE PACKAGE
COMMODORE C-64/C COMPUTER
COMMODORE 1541 DISK DRIVE
COMMODORE PRINTER
12" MONITOR
GEOS SOFTWARE PROGRAM
BOX OF 10 DISKETTES
DISK DRIVE HEAD CLEANER
GAME DISK

$339

COLOR MONITOR ADD *$90*

#4 COLOR PACKAGE
COMMODORE C-64/C COMPUTER
COMMODORE 1541/C DISK DRIVE
COMMODORE PRINTER
COLOR MONITOR
GEOS SOFTWARE PROGRAM
BOX OF 10 DISKETTES
DISK DRIVE HEAD CLEANER
GAME DISK

$458

C64C With Geos Software **$149.95**

C128 **$219.95**

NEW C-128D with Built in Disk Drive **$429**

#1700 128K EXPANSION MODULE	$99.95
#1764 EXPANSION MODULE	$119.95
XETEC JR. INTERFACE	$32.95
XETEC SR. INTERFACE	$52.95
C-128 POWER SUPPLY	$39.95
C64/C64-C POWER SUPPLY	$29.95
C-1660 MODEM	$34.95
XETEC SUPER GRAPHIC GOLD	$84.95
COMMODORE MOUSE	$26.88

XETEC LT. KERNEL 20MB. HARD DRIVES FOR
C64-C $749
C-128 $799

commodore DISK DRIVES

1541/C	$149.95
1571	$199.95
1581	$189.95
1541II	$164.95

MONITORS

1802 COLOR MONITOR	$169.95
1084 COLOR MONITOR	$284.95
THOMSON HI-RES RGB COLOR MONITOR	$299.95
MAGNAVOX RGB 13" COLOR MONITOR	$199.95

COMMODORE PRINTERS

MPS-1000	$159
MPS-1250	$229
DPS-1101 DAISY WHEEL PRINTER	$159

Commodore AMIGA 500

IN STOCK-CALL FOR LOW PRICE!
AMIGA 500 W/1084 ..... $779
AMIGA 500/1084/1010 ..... $979

AMIGA 2000 IN STOCK
ALL PERIPHERALS IN STOCK
A-501 · 512K EXPANSION · A-1010 3.5" FLOPPY DRIVE · A-1020T 5.25" DISK DRIVE WITH TRANSFORMER · A-2088D BRIDGE CARD · A-1084 RGB COLOR MONITOR · A-1680 MODEM · A-1080 SIDECAR · A-2090 HARD DRIVE CONTROLLER FOR A-2000 · A-2010 3.5" INTERNAL DISK DRIVE FOR A-2000 · A-2052 2MB EXPANSION FOR A-2000

Supra 20MB Hard Drive for A-500 ..... $699

NEW

commodore COLT

COMMODORE COLT Computer · 640K 4.77-7.16MHz · 2 Floppy Disk Drives · 12" High Resolution Mono Monitor · All Hook Up Cables & Adapters · Box of 10 Diskettes

$729

SPECIAL!
commodore PC10-1

PROFESSIONAL PACKAGE
PC10-1 Computer · 512K Expandable to 640K · 360K Disk Drive · Enhanced Keyboard · Serial & Parallel ports · 12" Monitor · All Hook Up Cables & Adapters Package of 10 Diskettes

$479

SAME PACKAGE W/20 MB HARD DRIVE $729

PRINTERS

NEC

P-6	$419.95
P-2200	$339.95

TOSHIBA

PS-321 SL	$479.95

EPSON

FX-86E	$289.95
FX-286E	$419.95
LQ-500	$315.95
LQ-800	$329.95
LQ-850	$509.95
LQ-1050	$699.95
LX-800	$199.95

Panasonic

1080i-II	$159.95
1092i	$289.95
1091Vii	$189.95

star

NX-1000C	$179.95
NX-1000C RAINBOW	$229.95
NX-1000	$169.95
NX-1000 RAINBOW	$219.95
NX-15	$289.95
NX-2400	$339.95
NB-2410	$409.95

OKIDATA

OKIDATA 120	$189.95
OKIDATA 180	$219.95
OKIDATA 183	$299.95
OKIMATE 20	$119.95
HP LASERJET SERIES II	$1629

SANYO PR-3000 DAISY WHEEL LQ PRINTER $89.50

apple

PACKAGES
APPLE IIC and APPLE IIE

- Apple IIC or IIE Computer
- 5.25" Drive · 12" Monitor All Hook-up Cables & Adaptors Package of 10 Diskettes

APPLE IIC	APPLE IIE
$579	$779

MAC SE	$1949
MAC SE W/20MB APPLE HARD DRIVE	$2599
IMAGEWRITER II Printer	$459
APPLE MAC + PACK	$1699
APPLE IIGS w/APPLE RGB COLOR MONITOR & 3.5" DISK DRIVE	$1379

LEADING EDGE

LEADING EDGE
MODEL D PACKAGE
IBM PC/XT COMPATIBLE

512K RAM Computer · Keyboard · 360K Floppy Drive 4.7-7.16 MHz. · 12" Monitor 8088-2 Processor

$729

SAME PACKAGE W/20 MB HAND DRIVE $989

BLUE CHIP

IBM PC/XT COMPATIBLE PKG
512K RAM Expandable to 640K · 360K Floppy Disk Drive · 12" Monitor

$449

SAME PKG. WITH 20 MB HARD DRIVE $699
SAME PKG W/ TWO FLOPPY DRIVES $499

SEAGATE

20 MB HARD DRIVE W/ CONTROLLER **$269**

40 MB HARD DRIVE & 30 MB HARD DRIVE NOW IN STOCK!

NO SURCHARGE FOR CREDIT CARD ORDERS

Certified Check, Bank Check, Money Orders, Visa, Am-Ex, Diners Club, Cart-Blanche, Discover Card & C.O.D.'s accepted. No additional surcharge for credit card orders. Non-certified checks must wait 4-6 weeks for clearance. N.Y. residents add applicable sales tax. Prices and availability subject to change without notice. Not responsible for typographical errors. Return of defective merchandise must have prior return authorization number, or returns will not be accepted. IBM PC/XT are registered trademarks of International Business Machine Corp. APO FPO orders please add 15% shipping & handling. All APO FPO orders are shipped first class priority air. All orders can be shipped Air Express - call for details.

```
      255,65,82,82,65,89
SE 190 DATA 32,69,82,82,79,82,
      7,0,32,38,142,169,1,96,
      141,2,255,32,0,4
JX 200 DATA 141,3,255,96
JJ 210 DATA 165,49,133,7,166,5
      0,134,8,197,51,208,4,22
      8,52,240,76,165
CC 220 DATA 100,5,101,5,102,20
      8,68,160,0,165,5,209,7,
      208,7,200,165,6
AC 230 DATA 209,7,240,27,160,2
      ,24,177,7,101,7,170,200
      ,177,7,101,8,133,8
QQ 240 DATA 134,7,197,52,208,2
      20,228,51,240,28,208,21
      4,160,4,177,7,170
MD 250 DATA 202,240,22,224,1,2
      08,14,200,177,7,208,9,2
      00,177,7,170,202
SH 260 DATA 228,103,176,4,162,
      1,56,96,160,4,177,7,141
      ,247,7,201,1,240
QE 270 DATA 31,200,177,7,141,2
      49,7,200,177,7,141,248,
      7,200,177,7,141
CK 280 DATA 251,7,200,177,7,14
      1,250,7,169,2,141,245,7
      ,208,27,160,0,132
QA 290 DATA 103,140,245,7,140,
      249,7,200,140,248,7,160
      ,5,177,7,141,251,7
QM 300 DATA 200,177,7,141,250,
      7,24,169,7,109,245,7,10
      1,7,141,245,7,165
GC 310 DATA 8,105,0,141,246,7,
      173,250,7,174,251,7,32,
      164,7,141,2,8,142
MR 320 DATA 3,8,162,0,142,4,8,
      142,5,8,166,103,240,22,
      24,173,2,8,109,4,8
HA 330 DATA 141,4,8,173,3,8,10
      9,5,8,141,5,8,202,208,2
      34,56,173,250,7
RB 340 DATA 233,1,141,254,7,17
      3,251,7,233,0,141,255,7
      ,173,254,7,174,255
MD 350 DATA 7,32,188,7,133,5,1
      34,6,160,0,177,5,208,23
      ,173,254,7,208,3
SX 360 DATA 206,255,7,206,254,
      7,173,255,7,13,254,7,20
      8,218,162,0,56,96
MD 370 DATA 173,254,7,141,252,
      7,173,255,7,141,253,7,1
      73,252,7,174,253.7
CE 380 DATA 32,188,7,133,5,134
      ,6,160,0,177,5,208,27,1
      73,254,7,174,255,7
MK 390 DATA 32,188,7,133,7,134
      ,8,32,7,7,173,254,7,208
      ,3,206,255,7,206
MB 400 DATA 254,7,173,252,7,20
      8,3,206,253,7,206,252,7
      ,173,253,7,13,252
MG 410 DATA 7,208,191,173,254,
      7,141,0,8,141,16,8,173,
      255,7,141,1,8,141
SE 420 DATA 17,8,56,173,16,8,2
      33,3,173,17,8,233,0,176
      ,4,162,0,56,96,173
PR 430 DATA 16,8,41,254,141,20
      ,8,173,17,8,141,21,8,78
      ,17,8,110,16,8,173
RH 440 DATA 16,8,141,18,8,173,
      17,8,141,19,8,173,18,8,
      141,22,8,173,19,8
XC 450 DATA 141,23,8,173,22,8,
      141,252,7,173,23,8,141,
      253,7,56,173,252,7
BC 460 DATA 237,16,8,141,254,7
      ,173,253,7,237,17,8,141
      ,255,7,173,252,7
FK 470 DATA 174,253,7,32,188,7
      ,133,7,134,8,173,254,7,
      174,255,7,32,188,7
KE 480 DATA 133,5,134,6,32,134
      ,6,144,49,32,7,7,173,25
      4,7,141,252,7,173
MF 490 DATA 255,7,141,253,7,56
      ,173,252,7,237,16,8,141
      ,254,7,173,253,7
QQ 500 DATA 237,17,8,141,255,7
      ,56,173,252,7,237,16,8,
      173,253,7,237,17,8
XH 510 DATA 176,176,24,173,22,
      8,109,16,8,141,22,8,173
      ,23,8,109,17,8,141
EH 520 DATA 23,8,56,173,0,8,23
      7,22,8,173,1,8,237,23,8
      ,144,3,76,191,5
PJ 530 DATA 238,18,8,208,3,238
      ,19,8,173,18,8,205,20,8
      ,208,8,173,19,8
RX 540 DATA 205,21,8,240,3,76,
      179,5,56,169,1,237,16,8
      ,169,0,237,17,8
MB 550 DATA 176,3,76,147,5,173
      ,0,8,174,1,8,24,96,32,2
      29,7,162,1,165,107
DJ 560 DATA 197,104,144,3,165,
      104,202,133,111,134,110
      ,201,0,240,21,160
RJ 570 DATA 0,177,105,209,108,
      240,4,144,11,176,11,200
      ,196,111,208,241
DA 580 DATA 165,110,208,2,24,9
      6,56,96,32,229,7,160,2,
      177,5,72,177,7,145
BS 590 DATA 5,104,145,7,136,16
      ,243,200,177,5,240,26,2
      00,24,113,5,141
KA 600 DATA 225,6,200,169,0,11
      3,5,141,226,6,160,1,185
      ,5,0,153,244,254
PK 610 DATA 136,16,247,160,0,1
      77,7,240,26,200,24,113,
      7,141,1,7,200,169
FR 620 DATA 0,113,7,141,2,7,16
      0,1,185,7,0,153,227,254
      ,136,16,247,96,160
GM 630 DATA 3,185,5,0,153,10,8
      ,136,16,247,200,140,8,8
      ,140,9,8,140,6,8
AA 640 DATA 140,7,8,24,173,245
      ,7,109,8,8,133,5,173,24
      6,7,109,9,8,133,6
EP 650 DATA 173,252,7,174,253,
      7,32,164,7,24,101,5,133
      ,5,138,101,6,133,6
SP 660 DATA 24,173,245,7,109,8
      ,8,133,7,173,246,7,109,
      9,8,133,8,173,254
XP 670 DATA 7,174,255,7,32,164
      ,7,24,101,7,133,7,138,1
      01,8,133,8,32,181
DQ 680 DATA 6,24,173,2,8,109,8
      ,8,141,8,8,173,3,8,109,
      9,8,141,9,8,238,6
BH 690 DATA 8,208,3,238,7,8,17
      3,248,7,205,6,8,208,8,1
      73,249,7,205,7,8
QP 700 DATA 240,3,76,31,7,160,
      3,185,10,8,153,5,0,136,
      16,247,96,141,14,8
XC 710 DATA 142,15,8,14,14,8,4
      6,15,8,24,109,14,8,72,1
      38,109,15,8,170
BR 720 DATA 104,96,32,164,7,24
      ,109,245,7,141,14,8,138
      ,109,246,7,141,15
EC 730 DATA 8,24,173,14,8,109,
      4,8,141,14,8,173,15,8,1
      09,5,8,141,15,8
XP 740 DATA 170?,173,14,8,96,16
      0,2,177,5,153,104,0,177
      ,7,153,107,0,136
MP 750 DATA 16,243,96
```

Program 2: Sort Demo

```
HE 10 REM COPYRIGHT 1988 COMPU
      TE! PUBLICATIONS, INC. -
       ALL RIGHTS RESERVED
ED 20 IFRGR(0)THENTB=23:ELSETB
      =3
MK 30 COLOR0,1:COLOR4,1:COLOR5
      ,12:PRINT"{CLR}"TAB(TB)"
      COPYRIGHT 1988 COMPUTE!
      {SPACE}PUB., INC.":PRINT
      TAB(TB+8)"ALL RIGHTS RES
      ERVED"
QM 40 POKE48,9:POKE50,9:CLR:RE
      M MOVE BANK1 UP FOR ML C
      ODE
DB 50 BLOAD"%SORT0",B0:BLOAD"%
      SORT1",B1
GD 60 PRINT"{CLR}"
JA 70 DIMA,B,T,A$(5),Q$(9,3),A
      Y$(2)
MR 80 Q$(7,0)="A1B2":Q$(8,0)="
      !Z RQ":Q$(4,0)="
      {3 SPACES}86":Q$(1,0)="
      {2 SPACES}123":Q$(2,0)="
      Z"
AH 90 FORX=0TO9:Q$(X,1)=STR$(1
      5-X):NEXT
BS 100 FORX=0TO9:Q$(X,2)=CHR$(
      INT(65+RND(1)*26)):NEXT
      :Q$(RND(1)*10,2)=""
GP 110 PRINT"{5}SORT BY COLUMN
       (0-3, 4 TO CONT): ";
RS 120 GETA$:IF(A$<"0")OR(A$>"
      4")THEN120
HS 130 PRINTA$:IFA$="4"THEN200
GQ 140 PRINT"{CLR}{5}"TAB(16)"
      ORIGINAL":PRINT" # COL
      {SPACE}0"," COL 1","COL
       2","COL 3"
XJ 150 FORB=0TO9:PRINT"{5}"B"
      {CYN}"Q$(B,0),"{2}"Q$(B
      ,1),"{6}"Q$(B,2):NEXT
QH 160 BANK14:SYS6912:Q$(VAL(A
      $)):IFPEEK(6)THENEND:RE
      M DUMMY VARIABLE REQUIR
      ED
RR 170 IFRGR(0)THENPRINT"
      {HOME}{5}"TAB(52)"SORTE
      D ON COL "A$:T=40:ELSEP
      RINT"{5}"TAB(12)"SORTED
       ON COL "A$
HJ 180 PRINTTAB(T)" # COL 0","
       COL 1","COL 2","COL 3"
FD 190 FORB=0TO9:PRINTTAB(T)"
      {5}"B"{CYN}"Q$(B,0),"
      {2}"Q$(B,1),"{6}"Q$(B,2
      ):NEXT:CLR:GOTO70
GP 200 CLR:DM=1000:PRINT"LONG
      {SPACE}LIST SORT DEMO..
      .":PRINT"SORT LIST OF"D
      M"STRINGS..."
JK 210 PRINT"CREATING LIST NOW
      ...":DIMA$(DM):REM FAST
PC 220 FORX=1TODM:FORY=1TO INT
      (RND(1)*8+1):A$(X)=A$(X
      )+CHR$(INT(RND(1)*26+65
      )):NEXTY,X
MM 230 PRINT"{BELL}SORTING NOW
      ...":BANK15:TI$="000000
      ":SYS6912:A$(1)
HA 240 IFPEEK(6)THENEND
SP 250 PRINTTI/60"SECONDS TO S
      ORT"DM"STRINGS":REM SLO
      W
ES 260 PRINT"DO YOU WANT TO SE
      E THE SORTED LIST? ";
```

COMPUTER DISCOUNTS ON ALL YOUR COMPUTER NEEDS

MIBRO COMPANY

COMPUTER DISCOUNTS ON ALL YOUR COMPUTER NEEDS

64 WEST 36th ST., NYC, NY 10018

OUR ONLY STORE!! ESTABLISHED SINCE 1950

COMMODORE 128D/20 PIECE OUTFIT

OUTFIT INCLUDES: Commodore 128D Keyboard With Built In 1571 Disc Drive •Commodore RGB Color Monitor •Commodore Printer •AC Adapter •Owners Manual •Disc Drive Head Cleaner •Package 10 Diskettes

$798

COMMODORE 64-C 20 PIECE DELUXE PACKAGE OUTFIT $358

OUTFIT INCLUDES: Commodore 64 C Keyboard •1541 Disc Drive •12" Computer Monitor •Commodore Printer •AC Adapter •Owners Manual •Disc Drive Head Cleaner •Package 10 Diskettes

COMMODORE 64-C 20 PIECE DREAM OUTFIT $458

OUTFIT INCLUDES: Commodore 64 C Keyboard •1541 Disc Drive •Commodore Color Monitor •Commodore Printer •AC Adapter •Owners Manual •Disc Drive Head Cleaner •Package 10 Diskettes

AMIGA 500 TOP OF THE LINE OUTFIT

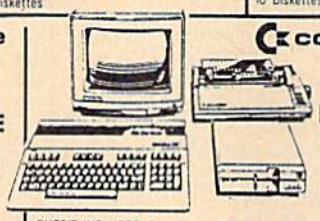
OUTFIT INCLUDES: Amiga 500 With Built In Drive •Amiga RGB Color Monitor •Printer For Amiga •Package 10 Diskettes •Disc Drive Head Cleaner •Owners Manual •USA Guarantee

AMIGA 501 • AMIGA 1010 AMIGA 1020 IN STOCK

$848

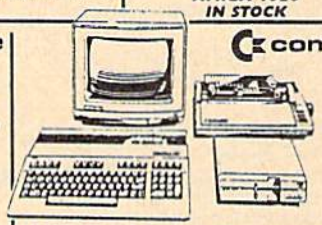
128 DREAM PACKAGE OUTFIT $488

OUTFIT INCLUDES: Commodore 128 Keyboard •1571 Disc Drive •12" Computer Monitor •Commodore Printer •AC Adapter •Owners Manual •Disc Drive Head Cleaner •Package 10 Diskettes



128 PROFESSIONAL OUTFIT $568

OUTFIT INCLUDES: Commodore 128 Keyboard •1571 Disc Drive •Commodore Color Monitor •Commodore Printer •AC Adapter •Owners Manual •Disc Drive Head Cleaner •Package 10 Diskettes



128 TOP OF THE LINE OUTFIT $648

OUTFIT INCLUDES: Commodore 128 Keyboard •Commodore 1571 Disc Drive •Commodore RGB Color Monitor •Commodore Printer •AC Adapter •Owners Manual •Disc Drive Head Cleaner •Package 10 Diskettes

'CHOOSE YOUR OWN PACKAGE DEAL'

MIX & MATCH THE COMPUTER SYSTEM THAT'S GOOD FOR YOU & ONE OF OUR COMPUTER SPECIALISTS WILL GIVE YOU A SPECIAL PRICE!

BLUE CHIP
25 PIECE PACKAGE
IBM XT COMPATIBLE*
$498 *AVAILABLE WITH: 3½" FLOPPY DRIVE*

FEATURES INCLUDE: 512K Ram Expandable to 640K Ram •10 Expansion Slots •Parallel & Serial Ports

PACKAGE INCLUDES: Blue Chip Keyboard W/360K Floppy Drive •12" Computer Monitor •Package 10 Diskettes •Disc Drive Head Cleaner •Word Processor •Spread Sheet •Data Base

WITH: 20 MEGABYTE HARD DRIVE.....$748
WITH: 30 MEGABYTE HARD DRIVE.....$798
WITH: 40 MEGABYTE HARD DRIVE.....$898

EPSON EQUITY II
25 PIECE PACKAGE
IBM XT COMPATIBLE*
$648 *AVAILABLE WITH: 3½" FLOPPY DRIVE*

FEATURES INCLUDE: 640K Ram •4.77 7.13 Switchable Megahertz •Parallel & Serial Ports

PACKAGE INCLUDES: Equity II Keyboard W/640K Floppy Drive •12" Computer Monitor •Package 10 Diskettes •Disc Drive Head Cleaner •Word Processor •Spread Sheet •Data Base •360K Floppy Drive

WITH: 20 MEGABYTE HARD DRIVE.....$898
WITH: 30 MEGABYTE HARD DRIVE.....$948
WITH: 40 MEGABYTE HARD DRIVE.....$1048

LEADING EDGE/MODEL D
25 PIECE PACKAGE
IBM XT COMPATIBLE*
$648 *AVAILABLE WITH: 3½" FLOPPY DRIVE*

FEATURES INCLUDE: 8088 Processor •360K Floppy Drive •Switchable 4.77 7.16 Megahertz

PACKAGE INCLUDES: Leading Edge Keyboard •Disc Drive •10 Diskettes •12" Computer Monitor •Disc Drive Head Cleaner •Owners Manual •AC Adapter •360K Floppy Drive •Word Processor •Spread Sheet •Data Base

WITH: 20 MEGABYTE HARD DRIVE.....$898
WITH: 30 MEGABYTE HARD DRIVE.....$948
WITH: 40 MEGABYTE HARD DRIVE.....$1048

VENDEX HEAD START IBM/XT Compatible*

FEATURES INCLUDE: •8088 Processor •4.77 8 Switchable Megahertz •Dual Floppy Drive •7 Expansion Slots •512K Ram Expandable To 768K Ram •Parallel Serial Ports •Mouse •Game •Light Pen Port

PRICED TOO LOW TO ADVERTISE!

COMMODORE COLT IBM/XT Compatible*

NEW FROM COMMODORE

FEATURES INCLUDE: 2 Speed •4.77 7.16 Megahertz •Parallel Serial Mouse Ports •640K Ram •Dual 360K Floppy Drive

CALL FOR NEW LOW PRICE!

Avail. W/20MB & 30 MB Hard Drives

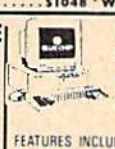
COMMODORE PC10-III IBM/XT Compatible*

NEW FROM COMMODORE

FEATURES INCLUDE: 3 Speed •4.77 7.16 9.77 Megahertz •Parallel Serial Mouse Ports •640K Ram •Single 360K Floppy Drive

CALL FOR NEW LOW PRICE!

Avail. W/20MB & 30 MB Hard Drives



BLUE CHIP PC Popular IBM/XT Compatible*

FEATURES INCLUDE: 8088 Processor •4.77 Switchable Megahertz •Parallel Serial Mouse Game Ports •512K Ram •Clock Back Up

AVAILABLE W/SINGLE & DUAL FLOPPY DRIVES

CALL FOR NEW LOW PRICE!

BLUE CHIP 286 IBM/AT Compatible*

FEATURES INCLUDE: 286 Processor •287 Co Processor Slot •6 8 10 Megahertz •8 Expansion Slots •1.2MB Floppy Drive •640K Ram Expandable To 2MB

PRICED TOO LOW TO ADVERTISE!!

Available With: 20/30/40/60/80 Megabyte Hard Drives

STORE TECHNICIANS ON PREMISES
FULL SERVICE & SUPPORT

COMMODORE AMIGA 2000
CALL FOR NEW LOW PRICE!

FEATURES INCLUDE: 1 MB Memory Expandable To 9 MB •Built In Seriel Centronics •RGB •Video Ports •Built In Mouse

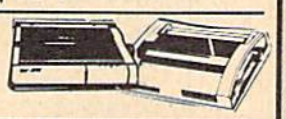
ALSO AVAILABLE: •AMIGA 1084 MONITOR •3.5 INTERNAL DRIVE •BRIDGE CARD •HARD DRIVE CONTROLLER •2MB RAM EXPANDER PACKAGE DEALS AVAILABLE!!

HARDWARE & SOFTWARE

COMMODORE 128 Computer	COMMODORE 1750 Expander
COMMODORE 64 Computer	COMMODORE 1351 Mouse
COMMODORE 64-C Computer	COMMODORE 1701 Monitor
COMMODORE 128D Computer	COMMODORE 1802 Monitor
COMMODORE 1541 Disc Drive	COMMODORE 1902 Monitor
COMMODORE 1541-C Disc Drive	COMMODORE 2002 Monitor
COMMODORE 1541-II Disc Drive	COMMODORE 1080 Monitor
COMMODORE 1571 Disc Drive	COMMODORE 1084 Monitor
COMMODORE 1581 Disc Drive	COMMODORE 801 Printer
COMMODORE 1660 Modem	COMMODORE 803 Printer
COMMODORE 1670 Modem	COMMODORE MPS-1000 Printer
COMMODORE 1764 Expander	COMMODORE MPS-1200 Printer
COMMODORE 1700 Expander	COMMODORE MPS-1250 Printer

ITEMS SOLD SEPARATELY CALL NOW FOR NEW LOW PRICES!!

TOP 20 BEST SELLING PRINTERS FOR COMMODORE & IBM



EPSON LX-800	PANASONIC KX-P1080i
EPSON LQ-500	PANASONIC KX-P1091i
EPSON LQ-850	PANASONIC KX-P1092i
EPSON LQ-1050	PANASONIC KX-P1592
EPSON FX-86E	PANASONIC KX-P1595
EPSON FX-286E	STAR NX-1000
OKIMATE 20	STAR NX-1000C
OKIMATE 120	STAR NX-15
OKIMATE 180	STAR NB-2415

STAR RAINBOW

CALL FOR NEW LOW PRICES!!!

ORDER NOW!! PHONE ORDERS ONLY CALL TOLL FREE

1 (800) 223-0322

FOR INFORMATION CALL (212) 695-7133

NEW YORK STATE RESIDENTS CALL (212) 695-7133/695-7134

VISA

MasterCard

ON ALL PHONE ORDERS PLEASE CALL
MON.-SAT. 10:00AM-7:30PM
SUNDAY 10:00 AM-6:00 PM

Use Master Card, Visa, American Express, or Send Money Order, Certified Check.

WE NOW TAKE DISCOVER & DINERS CLUB

MIBRO CO., INC.

64 West 36th Street, New York, N.Y. 10018
MON. THRU SAT. 10:00AM-7:30PM SUN. 10AM-6PM

All merchandise brand new factory fresh. Minimum shipping and handling charge $4.95 Shipping charges non-refundable. For mail orders please call before sending in money order. No money orders will be excepted without orders. All prices subject to change without notice. Quantities may be limited on some items. Refunds within seven days with original packaging and unfilled guarantee card. All orders subject to acceptance and verification. Prices subject to manufacturers increase and or decrease. Not responsible for typographical errors. For information please call customer service, please call between 12:30 pm 6:30 pm. Prices good for mail order only. Pictures are for illustration and may not be exact. Department of Consumer Affairs License No. 800 253. No returns accepted without prior verbal authorization.

```
QE 270 GETA$:IF(A$<>"Y")AND(A$
       <>"N")THEN270
MQ 280 PRINTA$:IFA$="Y"THENFOR
       X=1TODM:PRINTA$(X):NEXT
```

Boom and Bust

Article on page 38.

Program 1: Boom and Bust Main Program

```
HE 10 REM COPYRIGHT 1988 COMPU
      TE! PUBLICATIONS, INC. -
       ALL RIGHTS RESERVED
BX 20 IFA=1THEN80
MG 30 PRINT"{CLR}{9 DOWN}
      {7 RIGHT}{RVS}{6 SPACES}
      COPYRIGHT 1988{7 SPACES}
      {OFF}"
JS 40 PRINT"{7 RIGHT}{RVS}COMP
      UTE! PUBLICATIONS, INC.
      {OFF}"
XS 50 PRINT "{7 RIGHT}{RVS}
      {3 SPACES}ALL RIGHTS RES
      ERVED{5 SPACES}{OFF}":FO
      RI=1TO1500:NEXT
ER 70 A=1:LOAD"B&B.ML",8,1
JX 80 FORSD=0TO5:READSD(SD):PO
      KE52580+SD*2,SD(SD):NEXT
QQ 90 FORN=1TO8:READFH(N),FL(N
      ):NEXT:SID=54272
RD 100 DIMA$(50)
HX 110 READA$(T):IFA$(T)<>"END
       "THENT=T+1:GOTO110
SE 120 T=T-1:SYS16385:POKE845,
       0:POKE844,0
GR 130 FORN=0TO2*T:R1=INT(RND(
       0)*T):R2=INT(RND(0)*T)+
       1:T$=A$(R1):A$(R1)=A$(R
       2)
JP 140 A$(R2)=T$:NEXT
ME 150 K=0:P=1:SC(0)=0:SC(1)=0
       :SF(0)=0:SF(1)=0:FL=0:R
       G=0:FF=0
BQ 160 PRINT"{CLR}":POKE214,11
       :POKE211,14:PRINTCHR$(1
       42)"{CYN}BOOM AND BUST"
       :GOSUB880
QX 170 PRINT"{WHT}{8 DOWN}
       {10 RIGHT}PRESS {RVS}1
       {OFF} FOR 1 PLAYER"
DB 180 PRINT"{DOWN}{10 RIGHT}P
       RESS {RVS}2{OFF} FOR 2
       {SPACE}PLAYERS ";
CB 190 GETK$:IFK$=""THEN190
XE 200 IFK$<>"1"ANDK$<>"2"THEN
       190
JJ 210 PRINTK$;:D$(1)="PHRASE"
       :D$(2)="THING":D$(3)="O
       CCUPATION"
DE 220 P$(0)="{RVS}{RED} PLAYE
       R 1 {OFF}":P$(1)="{RVS}
       {YEL} PLAYER 2 {OFF}":E
       $="{11 SPACES}"
AB 230 IFK$="1"THENK=1:P=0:P$(
       1)="{2 SPACES}{RVS}
       {YEL} BONUS {OFF}"
CR 240 FORT1=0TOT:FORSD=0TO5:P
       OKE52580+SD*2,SD(SD):NE
       XT
FH 250 POKE845,0:POKE53269,PEE
       K(53269)OR1
CQ 260 Q=0
MR 270 D$=LEFT$(A$(T1),1):A$=R
       IGHT$(A$(T1),LEN(A$(T1)
       )-1)
HJ 280 D=VAL(D$):D$=D$(D):SC(0
       )=0:SC(1)=0:RG=0
MX 290 IFK=1THENSC(1)=100
JP 300 F=(40-LEN(A$))/2
XX 310 POKE857,30:POKE845,0:GO
       SUB1110
BM 320 SP=0:FORN=1TOLEN(A$):M$
       =MID$(A$,N,1):IFM$=" "T
       HENSP=SP+1:GOTO340
PQ 330 POKE1703+N+F,83:POKE559
       75+N+F,1
FG 340 NEXT
PD 350 IFK=0THENP=ABS(P-1)
EP 360 TM=125:POKE844,P
QQ 370 GOSUB1170
AA 380 FR=FRE(0):POKE845,1
RD 390 WR=0:IFPEEK(197)=4THENP
       OKE845,0:GOSUB660:IFWR=
       2THENNEXTT1:GOTO1040
CJ 400 IFWR=1THENPOKE53269,PEE
       K(53269)OR1:GOTO350
KJ 410 TM=TM-1:IFTM<10THENGOSU
       B970
CB 420 IFTM<1ANDPEEK(833)<>2AN
       DPEEK(857)=QTHENPOKE845
       ,0:D=30:GOSUB840:GOTO35
       0
BG 430 IFPEEK(845)=1THEN390
HG 440 TM=100:FORN=1TO500:NEXT
       N:IFPEEK(857)=QTHEND=20
       :GOSUB840:GOTO350
MM 450 Q=PEEK(857):R=PEEK(837)
       :S=PEEK(838)/2:L=94-(R*
       6)-(6-S)
BE 460 IN=0:IFL>90THENL=L-56:I
       N=64
SM 470 M=0:FORN=1TOLEN(A$)
PS 480 IFMID$(A$,N,1)<>CHR$(L)
       THEN570
DA 490 RG=RG+1:M=1:POKE54283,3
       3:POKE1703+N+F,L-64+IN:
       POKE55975+N+F,7
JG 500 A1$=LEFT$(A1$,N-1)+" "+
       MID$(A1$,N+1,LEN(A1$)):
       POKE54283,32
RX 510 SC(P)=SC(P)+10:GOSUB610
RP 520 MA=1:FM=0:FORN1=1TOLEN(
       A$):M$=MID$(A1$,N1,1):I
       FM$=" "THEN550
QF 530 IFFM=0THENM1$=M$:FM=1
DP 540 IFM$<>M1$THENMA=0
JE 550 NEXT
RQ 560 IFLEN(A$)-RG-SP=1ORMA=1
       THENGOSUB660:GOTO1010
AF 570 NEXT
KQ 580 IFM=1THEN380
CE 590 D=20:GOSUB840:GOTO350
MS 600 REM
SD 610 FORC=0TO1:SC$(C)=STR$(S
       C(C)):SC$(C)=SC$(C)+LEF
       T$(E$,7-LEN(SC$(C))):NE
       XT
ME 620 FORC=0TO1:SC$(C)=STR$(S
       C(C)):SC$(C)=SC$(C)+LEF
       T$(E$,7-LEN(SC$(C))):NE
       XT
QC 630 PRINT"{GRN}";:POKE214,2
       1:PRINT:POKE211,1:PRINT
       "$"SC$(0)TAB(31)"$"SC$(
       1);
HS 640 RETURN
BC 650 REM
SP 660 POKE53269,PEEK(53269)AN
       D254:POKE198,0:POKE214,
       22:PRINT:POKE211,0:W=0:
       G$=""
GF 670 PRINT"{CYN}GUESS? ";:FO
       RN=1TOLEN(A$):PRINT"
       {WHT}{@}";:NEXT:PRINT"
       {UP}":PRINT"{7 RIGHT}";
JR 680 GETG1$:IFG1$=""THEN680
FR 690 G1=ASC(G1$):IFG1=13THEN
       770
PQ 700 IFG1=20ANDG$<>""THENG$=
       LEFT$(G$,LEN(G$)-1):FL=
       1
DP 710 IFFL=1AND(LEN(G$)<LEN(A
       $))THENPRINT"{LEFT}{@}
       {LEFT}";
SK 720 IFFL=1AND(LEN(G$)>LEN(A
       $)-1)THENPRINTG1$;
XS 730 IFFL=1THENFL=0:GOTO680
FG 740 IFG1>90ORG1<32THEN680
MS 750 IFLEN(G$)<33THENPRINTG1
       $;:G$=G$+G1$
PG 760 GOTO680
XP 770 IFG$<>A$THEN810
KS 780 WR=2:SF(P)=SF(P)+SC(P)+
       500+SC(1)*K:SC(1)=0
XD 790 POKE781,23:SYS59903:PRI
       NT"RIGHT!";:POKE53269,P
       EEK(53269)OR1:GOSUB610
XA 800 GOSUB1110:GOSUB880:RETU
       RN
MD 810 IFK=1THENSC(1)=0
KA 820 POKE781,23:SYS59903:PRI
       NT"WRONG!";:D=50:GOSUB8
       40:POKE781,23:SYS59903
FR 830 WR=1:GOSUB610:RETURN
BS 840 POKESID+4,17:FORW=DTO5
       {SPACE}STEP-1:POKESID+1
       ,W:FORN=1TOD:NEXT:NEXT:
       POKESID+4,16
MM 850 IFK=1THENSC(1)=SC(1)-10
       :IFSC(1)<0THENSC(1)=0
RA 860 GOSUB610:RETURN
CA 870 REM
QA 880 POKESID+5,15:POKESID+6,
       252:POKESID+12,15:POKES
       ID+13,252:WF=64
MH 890 FORL=1TO30:N=INT(RND(0)
       *6)+3
CP 900 IFN=9THENFORW=1TO60:NEX
       T:GOTO950
QK 910 POKESID,FL(N):POKESID+1
       ,FH(N):POKE53248,FL(N)
HP 920 POKESID+7,FL(N)+10:POKE
       SID+8,FH(N)
EH 930 IFWF=64THENPOKESID+3,7:
       POKESID+2,150:POKESID+1
       0,7:POKESID+9,150
QC 940 POKESID+4,WF+1:POKESID+
       11,17:FORW=1TO80:NEXT:P
       OKESID+4,WF:POKESID+11,
       16
PC 950 NEXT:POKE53248,28:RETUR
       N
RG 960 REM
CD 970 POKESID+6,242:POKESID+1
       ,80:POKESID+4,17:POKESI
       D+4,16
BQ 980 FORN=1TOTM+80:NEXTN:POK
       ESID+1,60:POKESID+4,17
EA 990 POKESID+4,16:FORN=1TOTM
       +50:NEXTN:RETURN
HB 1000 REM
QG 1010 IFWR=2THENNEXTT1:GOTO1
        040
KG 1020 IFK=0THENP=ABS(P-1):GO
        SUB1170:GOSUB660:IFWR=
        2THENNEXTT1:GOTO1040
JJ 1030 PRINT:PRINTA$:FORN=1TO
        1500:NEXT:NEXTT1
XE 1040 POKE53269,1
EE 1050 IFSF(0)>SF(1)THENP$=P$
        (0)
FF 1060 IFSF(0)<SF(1)THENP$=P$
        (1)
SG 1070 IFSF(0)=SF(1)THENPRINT
        SPC(15);:PRINT"
        {3 DOWN}{PUR}TIE GAME!
        !":GOTO1100
CQ 1080 PRINT:PRINT"{5 DOWN}
        {2 UP}{3 RIGHT}{PUR}CO
        NGRATULATIONS TO "P$
BC 1090 PRINT:PRINT"{3 RIGHT}B
        OOM AND BUST CHAMPION!
        !"
```

```
ME 1100 GOSUB880:GOTO130
HM 1110 FORC=0TO1:SF$(C)=STR$(
        SF(C)):SF$(C)=SF$(C)+L
        EFT$(E$,7-LEN(SF$(C)))
        :NEXT
JD 1120 PRINT"{RED}":GOSUB610:
        POKE214,19:PRINT:POKE2
        11,1
KP 1130 IFK=0THENPRINT"{RED}$"
        SF$(0)SPC(22)"{YEL}$"S
        F$(1)
QB 1140 IFK=1THENPRINT"{RED}$"
        SF$(0)
KX 1150 PRINTP$(0)SPC(19)P$(1)
        :GOSUB610:A1$=A$
DJ 1160 RETURN
AQ 1170 POKE53280,9-P*2:POKE21
        4,11:PRINT:POKE211,10:
        PRINTP$(P)" "D$:RETURN
BS 1180 REM
JP 1190 DATA 153,154,163,164,1
        65,166
XS 1200 DATA28,49,31,165,33,13
        5,37,62,42,62,44,193,5
        0,60,25,30
PJ 1210 DATA"1A STITCH IN TIME
         SAVES NINE"
DJ 1220 DATA"1VIOLETS ARE BLUE
        "
FS 1230 DATA"1LOVE CONQUERS AL
        L"
JX 1240 DATA"1WHERE IS THE FIR
        E"
MP 1250 DATA"1ET CALL HOME"
GF 1260 DATA"1ALONG CAME A SPI
        DER"
CJ 1270 DATA"3POLICE OFFICER"
HJ 1280 DATA"1PLEASE KEEP OFF
        {SPACE}THE GRASS"
RS 1290 DATA"1LITTLE RED RIDIN
        G HOOD"
JP 1300 DATA"1THE RIGHT STUFF"
RB 1310 DATA"1A PENNY FOR YOUR
         THOUGHTS"
MX 1320 DATA"3SCHOOL TEACHER"
JX 1330 DATA"3TAXI DRIVER"
XQ 1340 DATA"2BOOK MARKER"
SK 1350 DATA"2CAR"
FE 1360 DATA"2SHOPPING CART"
JR 1370 DATA"2A GLASS OF MILK"
AA 1380 DATA"3COMPUTER PROGRAM
        MER"
QF 1390 DATA"3COOK"
DR 1400 DATA"3NURSE"
SC 1410 DATA"3INVENTOR"
BA 1420 DATA"1SILENCE IS GOLDE
        N"
PD 1430 DATA"1SUGAR AND SPICE"
RF 1440 DATA"1THE THREE LITTLE
         PIGS"
CS 1450 DATA"END"
EP 1460 END
```

Program 2: Boom and Bust ML

See instructions in article on page 38 before typing in.

```
3EC0:00 00 00 00 02 00 0C 40 A5
3EC8:00 00 04 00 03 00 C0 00 5F
3ED0:10 00 00 C3 00 00 24 00 D9
3ED8:00 4C 00 00 00 00 00 A8 11
3EE0:00 02 FE 00 02 AA 00 02 7A
3EE8:AA 00 C2 AA 0C C2 AA 0C 8A
3EF0:CA AA 8C EA AA AC CA AA 06
3EF8:8C C2 AA 0C C0 00 0C FF A0
3F00:2A 5A 80 A9 56 A0 A6 59 B0
3F08:A0 25 55 80 26 59 00 05 6E
3F10:A5 00 3D 57 F0 3F EF F0 D3
3F18:03 EF 00 01 55 00 01 55 26
3F20:00 02 AA 00 02 AA 00 02 31
3F28:AA 00 C2 AA 0C C2 AA 0C CB
3F30:CA AA 8C EA AA AC CA AA 47
3F38:8C C2 AA 0C C0 00 0C FF E1
3F40:A0 00 A0 28 02 80 2A 5A 66
3F48:80 A9 56 A0 A6 59 A0 26 48
3F50:59 80 25 A5 00 C6 59 30 98
3F58:FD 57 F0 0F EF C0 03 EF 33
3F60:00 05 55 40 15 65 50 55 03
3F68:55 54 51 65 05 51 55 0A 49
3F70:A1 65 00 01 55 3C F1 45 ED
3F78:50 15 45 40 05 45 00 00 4E
3F80:00 00 08 28 00 10 18 00 F2
3F88:00 01 0A 00 00 0E 00 00 C0
3F90:0C 00 00 00 00 00 00 40 55
3F98:05 80 00 03 00 00 06 01 F6
3FA0:00 00 07 80 00 03 00 01 15
3FA8:02 00 03 80 00 01 80 00 95
3FB0:20 04 00 60 00 00 00 00 46
3FB8:08 01 00 18 00 00 08 03 10
3FC0:00 7E 00 01 FF 80 07 FF FE
3FC8:E0 1F FF F8 3F FF FC 7F 82
3FD0:FF FE 7F FF FE FF FF FF F6
3FD8:FF FF FF FF FF FF FF FF 57
3FE0:FF FF FF FF 7F FF FE 3F 98
3FE8:FF FC 1F FF F8 0F FF F0 7F
3FF0:03 FF C0 00 FF 00 00 3C 45
3FF8:40 01 FF 80 02 7E 00 FF E9
4000:38 20 EF 43 A9 00 8D 21 60
4008:D0 A9 0A 8D 20 D0 A9 8C 99
4010:8D 01 C0 A9 84 8D 02 C0 69
4018:A9 C4 8D 03 C0 A9 C4 8D 44
4020:04 C0 A9 E0 8D 05 C0 A9 C1
4028:FC 8D 1B D0 A9 FD 8D F9 55
4030:07 A9 03 8D 1C D0 A9 07 56
4038:8D 26 D0 A9 01 8D 25 D0 17
4040:A0 00 A9 00 99 00 D4 C8 85
4048:C0 19 D0 F8 A9 02 8D 27 B0
4050:D0 8D 28 D0 A0 01 98 99 82
4058:28 D0 C8 C0 09 D0 F7 A9 6B
4060:35 8D 05 D4 A9 63 8D 06 C8
4068:D4 A9 18 8D 01 D4 A9 50 98
4070:8D 00 D4 A9 3A 8D 0C D4 E1
4078:A9 0B 8D 0D D4 A9 0C 8D 06
4080:18 D4 A0 00 A9 18 99 7A B1
4088:CD C8 C8 18 69 50 C0 3E 09
4090:D0 F4 A9 FF 8D 3C 03 A9 F8
4098:B4 8D 3D 03 A9 90 8D 3E 97
40A0:03 A9 6C 8D 3F 03 A9 48 15
40A8:8D 40 03 A9 C3 8D 47 03 E0
40B0:A9 9F 8D 48 03 A9 7B 8D 67
40B8:49 03 A9 57 8D 4A 03 A9 8E
40C0:33 8D 4B 03 20 91 43 78 1E
40C8:A9 7F 8D 0D DC A9 01 8D 9D
40D0:1A D0 A9 05 8D A7 02 AD D4
40D8:3C 03 8D 12 D0 A9 1B 8D FB
40E0:11 D0 A9 02 8D 14 03 A9 DF
40E8:41 8D 15 03 A9 32 85 FB 5D
40F0:A9 78 85 FD A9 00 85 C3 11
40F8:A9 CD 85 C4 85 FC 85 FE E8
4100:58 60 AD 19 D0 8D 19 D0 CD
4108:C9 04 D0 03 4C 30 42 CE 31
4110:A7 02 10 05 A9 04 8D A7 59
4118:02 AE A7 02 AC 4E 03 A9 AA
4120:00 9D 51 03 B1 FD 18 69 83
4128:01 91 FD 99 02 D0 D0 0C E9
4130:20 DC 43 BD 01 C0 4D 43 27
4138:03 9D 01 C0 BD 01 C0 8D D0
4140:10 D0 B1 FB C9 FE D0 08 E8
4148:A9 00 99 03 D0 4C 56 41 A8
4150:BD 47 03 99 03 D0 AD 41 75
4158:03 C9 02 D0 5C B1 FB C9 87
4160:FE F0 56 AD 00 D0 C9 F6 12
4168:90 06 B1 FD C9 28 90 49 24
4170:BD 47 03 38 ED 03 D0 C9 6E
4178:07 B0 3E B1 FD ED 02 D0 0A
4180:C9 0A B0 35 AD 1E D0 29 84
4188:02 C9 02 D0 2C 20 DC 43 AA
4190:BD 01 C0 2D 43 03 F0 0A 2F
4198:AD 01 C0 29 01 D0 0A 4C 88
41A0:B9 41 AD 01 C0 29 01 D0 93
41A8:10 A9 FE 91 FB 8E 45 03 3E
41B0:8C 46 03 EE 59 03 20 31 A2
41B8:43 B1 FB 8D 44 03 8C 43 2C
41C0:03 98 4A A8 AD 44 03 99 DC
41C8:F9 07 AC 43 03 88 88 F0 10
41D0:03 4C 24 41 18 A5 C3 69 C8
41D8:0C 85 C3 18 A5 FB 69 0C B8
41E0:85 FB 18 A5 FD 69 0C 85 B5
41E8:FD C9 B4 F0 03 4C 27 42 5C
41F0:A9 78 85 FD A9 00 85 C3 13
41F8:A9 32 85 FB 8E 42 03 8C 5D
4200:43 03 20 39 42 AE 42 03 D2
4208:AC 43 03 AD 41 03 C9 02 9A
4210:D0 15 AD 03 D0 38 E9 03 66
4218:8D 03 D0 4A 8D 08 D4 0A 23
4220:C9 26 B0 03 20 31 43 BD 63
4228:3C 03 8D 12 D0 8A F0 06 F6
4230:68 A8 68 AA 68 40 4C 31 D8
4238:EA AD 4C 03 D0 06 AD 00 51
4240:DC 4C 47 42 AD 01 DC A0 1F
4248:00 A2 00 4A B0 01 88 4A FE
4250:B0 01 C8 4A B0 02 CA CA 19
4258:4A B0 02 E8 E8 4A B0 3F 0E
4260:AD 4D 03 F0 3A AD 41 03 8C
4268:C9 02 F0 33 A9 0F 8D 0F 57
4270:D4 A9 0A 8D 13 D4 8D 14 FE
4278:D4 A9 81 8D 12 D4 A9 21 33
4280:8D 0B D4 AD 15 D0 09 02 04
4288:8D 15 D0 A9 FB 8D F8 07 DC
4290:A9 0F 8D 18 D4 A9 02 8D BF
4298:41 03 A9 00 8D 4D 03 8A E5
42A0:18 6D 00 D0 8D 00 D0 AD 55
42A8:01 C0 29 01 F0 0F AD 00 32
42B0:D0 C9 42 90 16 A9 42 8D CA
42B8:00 D0 4C 0F 43 AD 00 D0 8D
42C0:F0 09 C9 17 B0 05 A9 18 AF
42C8:8D 00 D0 AD 00 D0 D0 3F 2D
42D0:AD 01 C0 49 01 8D 01 C0 1A
42D8:8A 18 6D 00 D0 8D 00 D0 E3
42E0:AD 41 03 C9 02 F0 28 AD 5B
42E8:01 C0 49 02 8D 01 C0 AD 07
42F0:05 C0 49 02 8D 05 C0 AD 21
42F8:02 C0 49 02 8D 02 C0 AD 9B
4300:03 C0 49 02 8D 03 C0 AD 29
4308:04 C0 49 02 8D 04 C0 AD B5
4310:41 03 C9 02 F0 10 AD 00 74
4318:D0 8D 02 D0 AD 59 03 C9 5A
4320:1E D0 03 20 91 43 A9 80 B9
4328:8D 12 D4 A9 0A 8D 18 D4 BA
4330:60 A9 FC 8D F8 07 A9 20 21
4338:8D 0B D4 AD 15 D0 29 FD F9
4340:8D 15 D0 A9 80 8D 12 D4 BA
4348:A9 01 8D 41 03 A9 D2 8D 9B
4350:03 D0 AD 00 D0 8D 02 D0 D3
4358:AD 01 C0 29 03 C9 01 F0 D2
4360:07 C9 02 F0 03 4C 90 43 D9
4368:AD 01 C0 49 02 8D 01 C0 BB
4370:AD 05 C0 49 02 8D 05 C0 CC
4378:AD 02 C0 49 02 8D 02 C0 0E
4380:AD 03 C0 49 02 8D 03 C0 58
4388:AD 04 C0 49 02 8D 04 C0 A2
4390:60 A9 93 20 D2 FF A0 00 FD
4398:8C 10 D0 8C 59 03 A9 81 F7
43A0:99 34 CD C8 C8 18 69 01 C1
43A8:C0 30 D0 F4 A9 01 8D 4D BE
43B0:03 A9 E5 8D 03 D0 8D 01 30
43B8:D0 A9 FC 8D F8 07 A9 96 58
43C0:8D 00 D0 8D 02 D0 A9 0C B3
43C8:8D 4E 03 8D 57 03 A9 00 FC
43D0:8D 17 D0 8D 1D D0 A9 FD 54
43D8:8D 15 D0 60 8C 43 03 98 9B
43E0:4A A8 A9 02 0A 88 D0 FC 1D
43E8:AC 43 03 8D 43 03 60 A9 60
43F0:00 85 FB A9 20 85 FC A9 AD
43F8:C0 85 FD A9 3F 85 FE 78 22
4400:AD 0E DC 29 FE 8D 0E DC 38
4408:A5 01 29 FB 85 01 A0 00 F9
4410:B1 FD 91 FB C8 C0 40 D0 7D
4418:F7 A5 FB 18 69 40 85 FB 5A
4420:A5 FC 69 00 85 FC C9 3E D9
4428:D0 E4 A9 0D 85 FB A9 20 E7
4430:85 FC A9 00 85 FD A9 D0 38
4438:85 FE A9 00 8D 20 CB A0 9D
4440:00 B1 FD 91 FB E6 FB E6 68
4448:FB C8 C0 08 D0 F3 A9 30 73
4450:18 65 FB 85 FB A9 00 65 02
4458:FC 85 FC A9 08 18 65 FD 64
4460:85 FD A9 00 65 FE 85 FE 91
4468:EE 20 CB AD 20 CB C9 7A 03
4470:D0 CD A5 01 09 04 85 01 FD
4478:AD 0E DC 09 01 8D 0E DC BE
4480:58 60 FD 00 00 00 00 00 0D
```

☑ Check THEIR Ad then ☑ CHECK OUR PRICE!

3.5 Compatible Disk Drives $160
W/Pass Thru From
H.H.T • PHOENIX • MASTER 3A

3.5 INTERNAL $130 Amiga/P.C.

UNPOPULATED
- INSIDER..... $180
- Micron 2 Mg.... $Call

DIGIVIEW 2.0 $130

- PROGEN New Low Price
- Amiga 512K,2/6/8 Meg ... Call
- Starboard 2 ..... Call

commodore

COLT™ TURBO

SYSTEM INCLUDES:
- 640K
- Dual Drive
- Serial Port
- Parallel Port
- Graphics Card
- 2-Speed C.P.U.

$599.95*
*with any monitor purchase

MOST IBM SOFTWARE 40% OFF

Mention This Coupon and Get
$5 OFF the Competitions Price
on any Software Title ($25 Min. Purch)

WE WANT YOUR BUSINESS!
Send us a PAID invoice from any competitor in this magazine and we will credit you
$5 ON ANY NEW ORDER
By the Way—We Forgive You—($25 Min Purch)

APROTEK MINIMODEM from $79.95
Hayes Compatible (No Cable Needed)

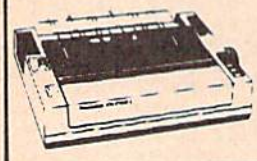
DIGIVIEW CAMERA PANASONIC 1410 $200

OKIMATE 20 $190 W/Plug & Print

- Fast Hackem ... $CALL
- COPY II PC..... $CALL
- MARAUDERII $24

AMIGA
20 MEG FROM $499.95
PHOENIX • SUPRA • C-LTD

Panasonic Industrial Company



Laser	$Call
1080i-II	$160*
1091I-II	$200*
1092i	$280*
1592i	$380*
1524i	$520*

*W/2 Ribbon Purchase

star micronics

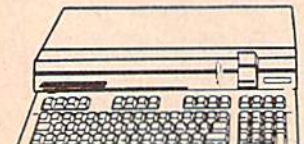
NX1000 Rainbow $220

Laser	$Call
NX1000	170*
NX15	300*
NB2410	380*
NR14	420*
Powertype LQ	200*
NX1000C	179*

*W/2 Ribbon Purchase

HARDWARE

- 1764 RAM $119.95
- 1351 Mouse $34.95
- AB Switch $30
- ALPS Color Prtr $400
- Time Saver $60
- 64 Power Supply... $27.95
- Amiga Hard Dr Cont... Call
- Dust Covers $8
  64/1541/128/1571
- MW 350 (2K) ..... $CALL
- Disk Case(3½)..... $8
- Disk Head Clnr..... $6
- Xetec Junior $34.95
- Epyx Joystick $15
- Most Cables..... $15
- Mouse Pad..... $6
- Super Snapshot II... $49.95
- Hard Cards..... $Call
- Digiview Stand $55
- Disk Notcher..... $4.95
- Cartridge Expander... $22.95
- Sonix Speakers $70



64C with GEOS.... $159.95
128D $429.95

Excelerator Plus... $149.95
(W/FREE SOFTWARE)

1541-II..... $169.95
1581 ..... $179.95
1571 ..... $209.95
Excel 2001 1571 Compatible $199.95

1802c $189.95
1084 ..... $274.95
Magnavox 8762... $249.95

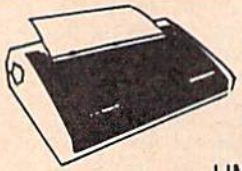
MODEMS

SUPRA
Hayes Compatible External
2400.... $149.95*

1670 commodore
MODEM..... $79.95

Avatex

1200 E $69.95*
1200 Int..... $69.95
1200 H.C.... $89.95*
2400 Baud... $179.95*
*W/Cable Purchase



22 C.P.S.
Daisy Wheel
$98.00
LIMITED QUANTITY
ALPHA PRO
Commodore or IBM Interface... $19.95

DISKS

3½ DS/DD GENERIC $1.30
3½ DS/DD .. FROM $1.50
SONY-FUJI-MAXELL-POLAROID

5¼ Generic (200 Lot) DS/DD 25¢
Includes Tyvek Sleeves, Label & Write Prtects!

commodore WE'VE GOT IT ALL!!

THE FOLLOWING LIST IS JUST A SAMPLE OF THE OVER 2000 SOFTWARE TITLES THAT WE SELL FOR COMMODORE.

MANY TITLES ARE AVAILABLE IN **AMIGA** AND **IBM** FORMATS WITH SIMILAR SAVINGS.

IF YOU DON'T SEE IT...CALL!!

MOST AMIGA, IBM and COMMODORE SOFTWARE 40% OFF LIST PRICE!!

Commodore Authorized Repair Center

Repairs: Commodore		Repairs: Amiga	
C-64 Keyboard	$56	Amiga 500	$100
C-128 Keyboard	70	Amiga 1000	100
1541 Align	30	Amiga 2000	125
1541 Repair (w/align)	60	A1010 Align	50
1571 Align	35	A1010 Repair	100
1571 Repair (w/align)	75	Add-On Devices Not Included!	
1702 Monitors	70	30 day warranty on all parts replaced. FREE return shipping in the U.S.	
1902 Monitors	80		

Include a detailed description of your problem. All 64's and 128's must have power supply included, include day and evening phone number. Repair prices do not include power supply of 64's and 128's! ALL REPAIRS ARE TO BE SENT PRE-PAID BY CHECK OR MONEY ORDER! Please mark box "ATTN. SERVICE".

DATA EAST

Commando	$20.95
Speed Buggy	17.95
Karate Champ	23.95
Tag Team Wrestling	20.95
Kid Niki	$CALL
Platoon	Call

Buy 2 Get 1 Free

Selected Titles

*Alien Fires	$19.95
*Battle Droidz	16.95
*Global Commander	19.95
*Hunt for Red October	25.95
*Master Ninja	19.95
*Monopoly	25.95
*Paper Clip Publisher	31.95
*Patton vs. Rommel	25.95
*Roadwars	19.95
*Rockford	19.95
*Rubicon Alliance	13.95
*Tobruk	19.95
Video Title Shop	19.95
Skate or Die	19.95
*Never Ending Story	13.95
*Gunslinger	19.95
Dark Lord	19.95
League of the Ancients	17.95
*Sky Fox II	19.95
Instant Music	22.95
Bard's Tale	25.95
Bard's Tale II	25.95
Chessmaster 2000	25.95
World Tour Golf	19.95
Marble Madness	19.95
Pegasus	19.95
Murder Party	22.95
Scrabble	22.95
America's Cup	22.95
Artic Fox	25.95
All Classics	10.95
Amnesia	25.95
Bismark	22.95
Chuck Yeager	22.95
Paper Clip III	31.95
Clue Books	$CALL
Dan Dare	13.95
Earth Orbit Station	19.95
Starfleet 1	25.95
Strike fleet	19.95
Sport of War	$CALL
Twilights Ransom	$CALL
Bard's Tale III	23.95
Wasteland	23.95

MINDSCAPE

Gauntlet	20.95
Paperboy	20.95
Perfect Score S.A.T.	41.95
Infiltrator II	20.95
*Deja Vu	23.95
*MISL Soccer	20.95
Super Star Hockey	20.95
High Roller	17.95
Indoor Sports	17.95
Super Star Soccer	20.95
Roadrunner	$CALL
Gauntlet II	20.95
Harrier Combat	17.95

ACCOLADE

*Card Sharks	17.95
Hard Ball	16.95
Apollo 18	17.95
Test Drive	17.95
Ace of Aces	17.95
Comics	17.95
Mini-Putt	17.95
Fourth and Inches	17.95

Jeopardy	
Wheel of Fortune	$8.95
Family Feud	each

Berkeley Softworks

Geowrite 128	$41.95
Geocalc 128	41.95
Geofile 128	41.95
GEOS 128	41.95
GEOS	35.05
Fontpak 1	17.95
Desk Pack	20.95
Writer Work Shop	29.95
Geodex	23.95
GeoCalc/GeoFile	each 29.95
Geopublish	41.95
Geoprogrammer	29.95
GEOspell	17.95
Triple Pack	29.95
Deskpack Plus	29.95
Fontpack Plus	17.95

Abacus

*BeckerBasic	29.95
GEOS Tricks and Tips	8.95
Abacus Books	$SAVE
GEOS In and Out (Disk)	8.95
Basic 128	35.95
Cadpak 128	35.95
Chartpak 128	23.95
Cobol 128	35.95
Super C 128	35.95
Super Pascal 128	35.95
Basic 64	23.95
Cadpak 64	23.95
Chartpak 64	23.95
Cobol 64	23.95
Super C Compiler 64/128	35.95
Super Pascal	35.95

ACCESS

Stealth Fighter	$23.95
MACH-128	29.95
Echelon	26.95
World Class Leaderboard	23.95
10th Frame	23.95
Exec Tournament	11.95
Triple Pak	11.95
Famous Courses 1	11.95
Famous Courses 2	11.95

ACTIVISION

I Am the 64	$17.95
I Am the 128	17.95
*Might and Magic Portal	23.95
Aliens	20.95
Last Ninja	20.95
Top Fuel Elim	17.95
Game Maker	23.95
Music Studio	17.95
Maniac Mansion	20.95
Air Ralley	17.95
Rampage	20.95
Black Jack Academy	23.95
Star Rank Boxing II	23.95
Skytravel	29.95

SPRINGBOARD

Certificate Maker	$29.95
Newsroom	29.95
Clip Art 1	17.95
Clip Art 2	23.95

MicroProse

Gunship	$20.95
F-15	20.95
Project Stealth Fighter	23.95
Airborne Ranger	23.95
Silent Service	23.95
Pirates	23.95
Top Gunner	17.95

PROFESSIONAL SOFTWARE

Fleet System 4	$47.95
Fleet System 2 Plus	35.95
Fleet Filer	23.95

UNISON WORLD

Art Gallery 1	$15.95
Art Gallery 2	15.95
Print Master	20.95

Broderbund Software

*Carmen/Europe	$CALL
*Ultima 5	$CALL
Super Bike Challenge	$CALL
Printshop	24.95
Graphics Lib	14.95
Carmen SanDiego (World)	20.95
Print shop comp	20.95
Carmen/USA	23.95
Arcade Construction Kit	17.95

subLOGIC

Flight Sim II	$31.95
Scenery Disk	16.95
Jet	29.95
Stealth Mission	31.95

TIMEWORKS

Word Writer 128	$41.95
Data Mgr 128	35.95
Swiftcalc 128	35.95
Partner 128	41.95
Sylvia Porter 128	41.95
Partner 64	35.95
Sylvia Porter 64	41.95
*Desktop Publisher	$CALL
Wordwriter 3	29.95

Xetec, Inc

Font Master II 64	$29.95
Font Master 128 W/Spell	41.95

EDYX

Destroyer	$23.95
*Four and Four Racing	$CALL
*Home Video Producer	$CALL
Impossible Mission II	$CALL
Summer Games II	$CALL
Fast Load	23.95
World Karate Champ	11.95
Super Cycle	11.95
World Games	23.95
Winter Games	11.95
Sub Battle	23.95
California Games	23.95
500 Joystick	14.95
Home Video Producer	29.95
Championship Wrestling	23.95
Create a Calendar	17.95
Street Sports Basketball	23.95
Street Sports Soccer	23.95
Street Sports Baseball	23.95
Summer Games	$Call
World's Greatest Baseball	11.95
World's Greatest Football	11.95
Games-Winter Edition	23.95
L.A. Crackdown	Call

ACTIONSOFT

Up Periscope	$19.95
Thunderchopper	19.95

SSI

Wargame Construction Set	$17.95
Roadwar Europa	23.95
Phantasie 1,2,3	each 23.95
Gemstone Healer	17.95
Gettysburg	35.95
Kampfgruppe	35.95
Ring of Zetfin	23.95
Road War 2000	23.95
Shard of Spring	23.95
Wizard's Crown	23.95
Panzer Strike	23.95
*Questron II	23.95
*Sons of Liberty	20.95
Eternal Dagger	23.95
Realms of Darkness	23.95
Wrath of Nicademus	$CALL
Pool of Radiance	Call

Pocket Writer 2/Filer/Planner	$35.95
Super Pack 2 (128)	59.95
Dictionary Disk	9.95

MICRO LEAGUE

Micro L. Baseball	$23.95
General Mgr	23.95
Stat Disk	14.95
87' Team Disk	11.95
Micro League Wrestling	23.95

SPINNAKER

Easy Working Filer	$7.95
Easy Working Writer	7.95
Easy Working Planner	7.95
Better Working Word Publisher	23.95
Turbo Load & Save	14.95
S.A.T. Complete	23.95
Business Form Shop	23.95
Homework Helper Writing	20.95
Homework Helper Word Problems	20.95

AVALON HILL

Wooden Ships and Iron Men	$20.95
Super Bowl Sunday	20.95
SBS 1985 Team Disks	11.95
SBS 1986 Team Disks	11.95
SBS Gen Mgr. Disk	11.95

MICROILLUSIONS

*Land of Legends	$23.95
*Galactic Invasion	14.95
*Planetarium	41.95
*Faery Tale	29.95
*Black Jack	23.95

ART WORX

NBA	$29.95
Bridge 5.0	20.95
Languages	11.95
Strip Poker	17.95
Data Disk	11.95

GAMESTAR

Championship Baseball	$23.95
Championship Football	23.95
GBA Basketball 2 on 2	23.95
Top Fuel Eliminator	17.95
Star Rank Boxing II	17.95

ORIGIN

Auto Duel	$23.95
Moebius	23.95
Ogre	23.95
Ultima III	35.95
Ultima IV	35.95
*Ultima V	$CALL

INFOCOM

Beyond Zork	$26.95
Hitchhiker's Guide	17.95
*Info Comics	$CALL
Hollywood Hijinx	23.95
Leather Goddesses	23.95
Lurking Horror	23.95
Nord & Bert	23.95
Moonmist	23.95
Zork Trilogy	41.95
Plundered Hearts	23.95
all Infoclues	6.95
Bureaucracy	20.95

MISC.

Mousetrap	11.95
Pacman	6.95
Ms. Pacman	6.95
Skariten	20.95
Wizardry	23.95
Dark Castle	20.95
Dome Bookeeping	23.95
Dig Dug	7.95
Sticky Bear (All)	17.95
Typing Tutor IV	29.95
Ghosts and Goblin	17.95
1942	17.95
Super Snapshop II	49.95
Top Gun	6.95
Flexidraw Light Pen	49.95
Flexidraw 5.5 Software	20.95
Final Cart III	54.95
Page Issultrator (128)	23.95
Page Builder 128	29.95
Carrier Command	Call
Vampire's Empire	17.95
Frost Byte	17.95

TAITO

Rastan	Call
Bubble Bobble	Call
Alcon	Call
Renegade	Call
Arkanoid	Call

CINEMAWARE

Warp Speed	$29.95
*SDI	20.95
Defender of the Crown	20.95
King of Chicago	20.95
3 Stooges	20.95
Rocket Ranger	20.95

PROGRESSIVE PERIPHERALS

Superbase 128		$59.95
Superbase 64		49.95
Superscript 128	50% off list	49.95
Superscript 64		39.95
Visastar 64		49.95
Visawrite 128		44.95
Microlawyer		44.95

KRACKER JAX

SAVE 40%

With any other purchase!

C128 Canon	$21
Shotgun II	$9
Bulls Eye	$12
KJ 5, 6, 7	$12
Hacker Util.	$12
Label Wizard	$15
Renegade	$21

MORE .....CALL!!

*Indicates New Release

ORDERS ONLY **800-433-7756**
IN MICH. 313-427-7713
FAX: 313-427-7766
Monday thru Friday – 10 A.M. to 8 P.M.
Saturday – 10 A.M. to 6 P.M. (E.S.T.)
CUSTOMER SERVICE **313-427-0267**
M-F 10-6

SCHOOL P.O.'s ACCEPTED
We Check For Charge Card Fraud

M.C.S.
MICROCOMPUTER SERVICES

CALL FOR TERMS — DEALER INQUIREES INVITED

No Surcharge for MC/VISA/DISCOVER — All Sales Are Final — Sorry no walk in traffic. All returns must have RA#. Merchandise found defective will be repaired or replaced. We do not offer refunds for defective products or for products that do not perform satisfactorily. We make no guarantees for product perfrmance. Any money back guarantee must be handled directly with the manufacturer. Call for shipping & handling info. Prices subject to change without notice.
12864 FARMINGTON ROAD, LIVONIA, MI 48150 — We cannot guarantee compatibility.

Shipping and Handling Charges Are Not Refundable

How To Type In *COMPUTE!'s Gazette* Programs

Each month, COMPUTE!'s Gazette publishes programs for the Commodore 128, 64, Plus/4, and 16. Each program is clearly marked by title and version. Be sure to type in the correct version for your machine. All 64 programs run on the 128 in 64 mode. Be sure to read the instructions in the corresponding article. This can save time and eliminate any questions which might arise after you begin typing.

We frequently publish two programs designed to make typing easier: The Automatic Proofreader, and MLX, designed for entering machine language programs.

When entering a BASIC program, be especially careful with DATA statements as they are extremely sensitive to errors. A mistyped number in a DATA statement can cause your machine to "lock up" (you'll have no control over the computer). If this happens, the only recourse is to turn your computer off then on, erasing what was in memory. So be sure to *save a program before you run it.* If your computer crashes, you can always reload the program and look for the error.

Special Characters

Most of the programs listed in each issue contain special control characters. To facilitate typing in any programs from the GAZETTE, use the following listing conventions.

The most common type of control characters in our listings appear as words within braces: {DOWN} means to press the cursor down key; {5 SPACES} means to press the space bar five times.

To indicate that a key should be *shifted* (hold down the SHIFT key while pressing another key), the character is underlined. For example, A means hold down the SHIFT key and press A. You may see strange characters on your screen, but that's to be expected. If you find a number followed by an underlined key enclosed in braces (for example, {8 A}), type the key as many times as indicated (in our example, enter eight SHIFTed A's).

If a key is enclosed in special brackets, [ ], hold down the Commodore key (at the lower left corner of the keyboard) and press the indicated character.

Rarely, you'll see a single letter of the alphabet enclosed in braces. This can be entered on the Commodore 64 by pressing the CTRL key while typing the letter in braces. For example, {A} means to press CTRL-A.

The Quote Mode

Although you can move the cursor around the screen with the CRSR keys, often a programmer will want to move the cursor under program control. This is seen in examples such as {LEFT}, and {HOME} in the program listings. The only way the computer can tell the difference between direct and programmed cursor control is *the quote mode.*

Once you press the quote key, you're in quote mode. This mode can be confusing if you mistype a character and cursor left to change it. You'll see a reverse video character (a graphics symbol for cursor left). In this case, you can use the DELete key to back up and edit the line. Type another quote and you're out of quote mode. If things really get confusing, you can exit quote mode simply by pressing RETURN. Then just cursor up to the mistyped line and fix it.

When You Read:	Press:	See:
{CLR}	SHIFT + CLR/HOME	
{HOME}	CLR/HOME	
{UP}	SHIFT + ↑ CRSR ↓	
{DOWN}	↑ CRSR ↓	
{LEFT}	SHIFT + ← CRSR →	
{RIGHT}	← CRSR →	
{RVS}	CTRL + 9	
{OFF}	CTRL + 0	
{BLK}	CTRL + 1	
{WHT}	CTRL + 2	
{RED}	CTRL + 3	
{CYN}	CTRL + 4	

When You Read:	Press:	See:
{PUR}	CTRL + 5	
{GRN}	CTRL + 6	
{BLU}	CTRL + 7	
{YEL}	CTRL + 8	
{ F1 }	f1	
{ F2 }	SHIFT + f1	
{ F3 }	f3	
{ F4 }	SHIFT + f3	
{ F5 }	f5	
{ F6 }	SHIFT + f5	
{ F7 }	f7	
{ F8 }	SHIFT + f7	

When You Read:	Press:	See:
←	←	
↑	SHIFT + ↑	

For Commodore 64 Only

When You Read:	Press:	See:
[1]	COMMODORE + 1	
[2]	COMMODORE + 2	
[3]	COMMODORE + 3	
[4]	COMMODORE + 4	
[5]	COMMODORE + 5	
[6]	COMMODORE + 6	
[7]	COMMODORE + 7	
[8]	COMMODORE + 8	

GAZ-8-88

Order Toll Free
800-558-0003

ComputAbility
Consumer Electronics

Order Toll Free
800-558-0003

Printers

Panasonic
1080i-II (144 CPS) 169
1091i-II (192 CPS) 199

Star
NX-1000 (144 CPS) 169
NX-1000 Rainbow (color) . 239

Modem Packages

Packages include modem and Peak RS-232 Cable

Avatex 1200 E 94.95
Avatex 1200 HC 115.95
Avatex 2400 ..... 191.95

Disk Drive Special

FSD-2
Disk Drive
Commodore 1541 Compatible
$159
Free Shipping In the Continental USA

AMIGA

AMIGA 500
Call For The Latest Lowest Price

Commodore

64C Computer
C-128D Computer
1541C Disk Drive
1571 Disk Drive
1802C Monitor
1084 Monitor
1351 Mouse
1750 RAM Expander
1764 RAM Expander
1670 Modem
Xetec Gold Interface

EPYX

Get $1 off the price of all pre-released titles when you put your advanced order in ! (These titles are in bold)

Apshai Trilogy	12.95	Fast Load	22.95
Battleship	***17.95***	4x4 Off Road Racing	22.95
BoulderDash Constr Set	12.95	Home Video Producer	30.95
California Games	22.95	Impossible Mission II	22.95
Champ Wrestling	12.95	L.A. Crack Down	22.95
Death Sword	12.95	***Legend of Blacksilver***	***22.95***
Destroyer	22.95	***Mind Roll***	***22.95***
Dive Bomber	22.95	***Neverness***	***22.95***
Final Assult	***22.95***	***Omnicron Conspiracy***	***22.95***
Games : Summer Ed	***22.95***	RAD Warrior	12.95
Games : Winter Edition	22.95	Skate Ball	22.95
Metro Cross	13.95	Sticker Maker	19.95
		Street Cat	***13.95***
		St. Sports Basketball	22.95
		St. Sports Baseball	22.95
		St. Sports Football	***22.95***
		St. Sports Soccer	22.95
		Sub Battle Simulator	22.95
		Super Cycle	12.95
		Summer Games1 or 2	12.95
		Sports - A - Roni	***13.95***
		Spy US Spy 3	12.95
		Technocop	***22.95***
		Tower Toppler	***22.95***
		Trials of Honor	***22.95***
		World Games	12.95

C-128 SOFTWARE

Basic Compiler 128	39.95	Fleet System 4	46.95	Pocket Filer 2	36.95
Beyond Zork	29.95	Fontmaster 128	36.95	Speed Term 128	25.95
Bureaucracy	22.95	GeoCalc 128	42.95	Superbase 128	57.95
Cad Pak 128	39.95	GeoFile 128	42.95	Super C Compiler	39.95
Chart Pak 128	25.95	Geos 128	42.95	Superscript 128	46.95
Cobol 128	39.95	GeoWrite 128	42.95	Super Pascal 128	39.95
Data Manager 128	32.95	Partner 128	32.95	SuperPak 2	59.95
				Super Pak 128	46.95
				Swiftcalc 128	32.95
				Sylvia Porter 128	42.95
				Visastar 128	64.95
				Wordwriter 128	32.95

AMIGA SOFTWARE

CALL FOR PRICE & AVAILABILITY

MISCELLANEOUS 64

$100,000 Pyramid	10.95
Animation Station	59.95
Art Gallery 1 or 2	16.95
Border Zone	22.95
Business Form Shop	25.95
Bumper Sticker Maker	31.95
Copy II 64	27.95
Create a BasketBall Team	17.95
Cycle Night	16.95
Dark Tower	19.95
Dark Castle	21.95
Final Cartridge 3	49.95
Flight Simulator II	27.95
Flexi Draw	CALL
Fontmaster 2	30.95
TV High Rollers	10.95
Hobbit	23.95
Hi Seas	32.95
Jet	27.95
Leather Goddesses	22.95
Lurking Horror	22.95
NBA	25.95
Night on the Town	19.95
Nord And Bert	22.95
Maniac Mansion	22.95
Micro League Baseball	25.95
Moonmist	22.95
Oxford Basic Tool Kit	19.95
Plundered Hearts	22.95
Pocket Dictionary	10.95
Pro FootBall Facts	31.95
Printmaster	21.95
Pure Stat Basketball	25.95
Pure Stat Football	25.95
Pure Stat Baseball	35.95
Sentry	25.95
Star Empire	17.95
Starfleet I	26.95
Station Fall	22.95
Star Trek 3/Rebel Universe	19.95
Sublogic Stealth Mission	33.95
Superscript 64	32.95
Superbase 64	46.95
SuperPak 2	59.95
Tetris	17.95
Three Stooges	22.95
Thunder Chopper	19.95
Typing Tutor 4	25.95
Up Periscope	19.95
Vampire's Empire	19.95
Warp Speed	32.95
Winter Challenge	10.95
Wizardry	25.95
WWF Wrestling	19.95
X-15	19.95
Zig Zag	17.95

ACTIVISION

Aliens	22.95
Champ Baseball '86	19.95
Crossbow	19.95
GFL Football	22.95
Hacker II	10.95
Last Ninja	22.95
Portal	25.95
Transformers	10.95
2 on 2 Basketball	22.95
Might & Magic	25.95
Gee Bee Air Rally	19.95
Postcards	17.95
Rampage	22.95
Court Tennis/StarBoxing	10.95
Star Rank Boxing	219.95

SPRINGBOARD

Certificate Maker	14.95
Cert. Maker Lib 1	10.95
Clip Art 1, 2 or 3	10.95
Graphics Expander	21.95
Newsroom	14.95

MICROPROSE

Airbourne Ranger	22.95
Crusade in Europe	25.95
Conflict in Vietnam	25.95
Decision in the Desert	25.95
F-15 Strike Eagle	22.95
Gunship	22.95
Kennedy Approach	16.95
Pirates	25.95
Red Storm Rising	25.95
Silent Service	22.95
Stealth Fighter	25.95
Top Gunner	16.95

SSI

B-24	23.95
Hero's of the Lance	20.95
Eternal Dagger	26.95
Panzer Strike	29.95
Phantasie I,II,or III	26.95
Pool of Radience	26.95
Questron II	26.95
Rings of Zilfin	26.95
Roadwar 2000	26.95
Roadwar Europa	26.95
Shard of Spring	26.95
Shiloh	26.95
Sons of Liberty	23.95
War In S. Pacific	38.95
Wargame Construction	20.95
Wizard's Crown	26.95

COSMI

Chemobel	16.95
Grand Slam BB	16.95
Navcom 6	17.95
President is Missing	16.95
Shirley Muldoney	16.95

TIMEWORKS

Business Systems	34.95
Data Manager II	15.95
Desktop Publisher	39.95
Evelyn Wood	15.95
Geos Writer	25.95
Partner 64	25.95
Sideways	15.95
Swiftax' 86	32.95
Swiftcalc/Sideways	15.95
Sylvia Porter	25.95
Wordwriter 3	25.95

BRODERBUND

Arcade Construction Kit	19.95
Autoduel	31.95
Carmen SanDgo Wrld/Eur	22.95
Cauldron	19.95
Graphic Lib. 1,2 or 3	16.95
Magnetron	16.95
Moebius	25.95
Ogre	19.95
P.S. Companion	22.95
Print Shop	28.95
Super Bike Challenge	14.95
Thinking Cap	22.95
Toy Shop	19.95
Ultima 1	25.95
Ultima 3	25.95
Ultima 4	38.95
Ultima 5 (September)	38.95

CAPCOM

Gunsmoke	19.95
Hat Trick	19.95
Mini-golf	19.95
SideArm	19.95
Speed Rumbler	19.95
Trojan	19.95
1942	19.95

MINDSCAPE

Bad Street Brawler	19.95
Block Buster 64	19.95
Bop 'N' Wrestle	19.95
Color Me	Call
Deeper Dungeons (4Gntlt)	17.95
Defender of the Crown	22.95
Deja Vu	22.95
Harrier Comb. Simulator	19.95
Head Over Heals	10.95
Indoor Sports 1 or 2	19.95
Infiltrator 2	22.95
Into the Eagle's Nest	19.95
Living Daylights	12.95
M.I.S.L. Soccer	22.95
Paper Boy	22.95
Roadrunner	22.95
Sinbad	22.95
S.D.I.	22.95
Superstar Ice Hockey	22.95
Superstar Soccer	22.95
Temple of Doom	22.95
The Gauntlet	22.95
Trailblazer	19.95
Wizball	16.95
Xevious	19.95
720	22.95

ACCESS

Echelon	29.95
Famous Courses	14.95
Firestorm	10.95
Leader Board Tri-Pak	10.95
Mach V-Cart	21.95
Triple Pak	14.95
Wild Class Leader Brd	25.95

ACCOLADE

Accolade Comics	18.95
Ace of Aces	18.95
Apollo 18	18.95
Bubble Ghost	CALL
Card Sharks	18.95
Hardball	18.95
Kill Until Dead	10.95
Mini Putt	18.95
Plasmatron	10.95
Power at Sea	18.95
Test Drive	18.95
The Train	18.95

ABACUS 64

Basic Compiler	25.95
Becker Basic	32.95
Chartpak	25.95
Cad-Pak	25.95
Forth	25.95
Geos Inside & Out	16.95
Powerplan	25.95
Personal Portfolio	25.95
Super C Compiler	39.95
Super Pascal	39.95
Xper System	39.95

DATA EAST

Breakthrough	19.95
Commando	14.95
Karate Champ	16.95
Karnov	19.95
Kid Nikki	19.95
Kung Fu Master	16.95
Last Mission	9.95
Platoon	19.95
Speed Buggy	19.95
Tag Team Wrestling	14.95
TNK 3	9.95
Ikari Warrior	19.95

ELECTRONIC ARTS

Adv. Construction	10.95
Alien Fires	20.95
Alternate Reality	20.95
American Civil War	26.95
America's Cup	10.95
Amnesia	26.95
Archon	10.95
Archon II	10.95
Arctic Fox	11.95
Bard's Tale	25.95
Bard's Tale III	26.95
Battle Droidz	17.95
Battle Disk/Pegasus	11.95
Battlefront	25.95
Bismarck	21.95
Carriers At War	31.95
Chessmaster 2000	25.95
Chickamauge	23.95
Dan Dare	14.95
Dark Lord	14.95
Delta Patrol	14.95
Demon Stalkers	20.95
Dragon's Lair	19.95
EOS	11.95
Europe Ablaze	31.95
Financial Cookbook	10.95
Force 7	14.95
Global Commander	20.95
Halls of Montezuma	26.95
Heart of Africa	10.95
Hunt for Red October	26.95
Instant Music	24.95
Lords of Conquest	10.95
Master Ninga	20.95
Marble Madness	11.95
Mavis Beacon Typing	20.95
Monopoly	26.95
Mail Order Monsters	10.95
Mind Mirror	10.95
Mule	10.95
Murder Party	10.95
Music Construction	10.95
One on One	10.95
Outrageous Pages	33.95
Paper Clip III	33.95
Paper Clip Publisher	33.95
Patton vs Rommel	11.95
Pegasus	23.95
Pinball Construction	10.95
Racing Destruction	10.95
Reach for the Stars	30.95
Roadwars	20.95
Road to Moscow	25.95
Robot Rascals	25.95
Rockford	21.95
Rommel For N. Africa	26.95
Rubicon Alliance	14.95
Russia	28.95
Scrabble	22.95
Scruples	26.95
Seven Cities of Gold	10.95
Skate or Die	21.95
Strike Fleet	21.95
Skyfox 2	21.95
Super Boulderdash	10.95
The Dungeon	26.95
Touchdown Football	10.95
Tobruk	23.95
Tomahawk	21.95
Twilight's Ransom	23.95
Ultimate Wizard	10.95
Video Title Shop	20.95
Wasteland	26.95
World Tour Golf	11.95
Yeager AFS	24.95

RAINBIRD

Elite	10.95
Pawn	25.95
Guild of Thieves	25.95
Sentry	25.95
Starglider	25.95

MICRO-ILLUSION

Black Jack Academy	25.95
Galactic Invasions	16.95
Fairy Tale Adv	32.95
Firepower	16.95
Lands of Legends	32.95
Planetarium	44.95
Romantic Encounter	25.95
Sky Travel	32.95
Turbo	16.95

BERKLEY SOFTWORKS

Deskpak I	21.95
Desk Pack Plus	19.95
Font Pack Plus	19.95
Font Pak I	18.95
Geocalc	31.95
Geo Triple Pak	31.95
Geodex	24.95
Geofile	31.95
Geo Programmer	42.95
Geopublish	42.95
Geos	36.95
Geospell	18.95
GeoWrite	31.95

KONAMI

Contra	19.95
Iron Horse	19.95
Jail Break	19.95
Rushin Attack/Kung Fu	19.95
Super Basketball	19.95

BINCE1982
ComputAbility
Consumer Electronics

P.O. BOX 17882, MILWAUKEE, WI 53217
ORDER LINES OPEN
Mon-Fri 9am-9pm CST Sat 11 am-5 pm CST
To Order Call Toll Free

800-558-0003

For Technical Info, Order Inquiries, or for Wisc.Orders

414-357-8181

Telex Number 910 2406440 (Answerback: Comput Mlw. UD)

MasterCard VISA

No Surcharge For Mastercard or Visa

ORDERING INFORMATION: Please specify system. For fast delivery send cashier's check or money order. Personal and company checks allow 14 business days to clear. School P.O.'s welcome. C.O.D. charges are $3.00. In Continental USA include $3.00 for software orders 5% shipping for hardware minimum $5.00. MasterCard and Visa orders please include card #, expiration date and signature. WI residents please include 5% sales tax. HI, AK, FPO, APO, Puerto Rico and Canadian orders, please add 6% shipping. Minimum $6.00. All other foreign orders add 15% shipping, minimum $15.00. All order shipped outside the Continental U.S.A are shipped first class insured U.S. mail. If foreign shipping charges exceed the minimum amount, you will be charged the additional amount to get your package to you quickly and safely. All goods are new and include factory warranty. Due to our low prices all sales are final. All defective returns must have a return authorization number. Please call (414)357-8181 to obtain an RA# or your return will not be accepted Prices and availability subject to change without notice.

The Automatic Proofreader

Philip I. Nelson

"The Automatic Proofreader" helps you type in program listings for the 128, 64, Plus/4, and 16 and prevents nearly every kind of typing mistake.

Type in the Proofreader *exactly* as listed. Since the program can't check itself, type carefully to avoid mistakes. Don't omit any lines, even if they contain unfamiliar commands. After finishing, save a copy or two on disk or tape before running it. This is important because the Proofreader erases the BASIC portion of itself when you run it, leaving only the machine language portion in memory.

Next, type RUN and press RETURN. After announcing which computer it's running on, the Proofreader displays the message "Proofreader Active". Now you're ready to type in a BASIC program.

Every time you finish typing a line and press RETURN, the Proofreader displays a two-letter checksum in the upper-left corner of the screen. Compare this result with the two-letter checksum printed to the left of the line in the program listing. If the letters match, it's almost certain the line was typed correctly. If the letters don't match, check for your mistake and correct the line.

The Proofreader ignores spaces not enclosed in quotes, so you can omit or add spaces between keywords and still see a matching checksum. However, since spaces inside quotes are almost always significant, the Proofreader pays attention to them. For example, **10 PRINT"THIS IS BASIC"** will generate a different checksum than **10 PRINT"THIS ISBA SIC"**.

A common typing error is transposition—typing two successive characters in the wrong order, like PIRNT instead of PRINT or 64378 instead of 64738. The Proofreader is sensitive to the *position* of each character within the line and thus catches transposition errors.

The Proofreader does *not* accept keyword abbreviations (for example, ? instead of PRINT). If you prefer to use abbreviations, you can still check the line by LISTing it after typing it in, moving the cursor back to the line, and pressing RETURN. LISTing the line substitutes the full keyword for the abbreviation and allows the Proofreader to work properly. The same technique works for rechecking programs you've already typed in.

If you're using the Proofreader on the Commodore 128, Plus/4, or 16, *do not perform any GRAPHIC commands while the Proofreader is active.* When you perform a command like GRAPHIC 1, the computer moves everything at the start of BASIC program space—including the Proofreader—to another memory area, causing the Proofreader to crash. The same thing happens if you *run* any program with a GRAPHIC command while the Proofreader is in memory.

Though the Proofreader doesn't interfere with other BASIC operations, it's a good idea to disable it before running another program. However, the Proofreader is purposely difficult to dislodge: It's not affected by tape or disk operations, or by pressing RUN/STOP– RESTORE. The simplest way to disable it is to turn the computer off then on. A gentler method is to SYS to the computer's built-in reset routine (SYS 65341 for the 128, 64738 for the 64, and 65526 for the Plus/4 and 16). These reset routines erase any program in memory, so be sure to save the program you're typing in before entering the SYS command.

If you own a Commodore 64, you may already have wondered whether the Proofreader works with other programming utilities like "MetaBASIC." The answer is generally yes, *if you're using a 64 and activate the Proofreader after installing the other utility.* For example, first load and activate MetaBASIC, then load and run the Proofreader.

When using the Proofreader with another utility, you should disable *both* programs before running a BASIC program. While the Proofreader seems unaffected by most utilities, there's no way to promise that it will work with any and every combination of utilities you might want to use. The more utilities activated, the more fragile the system becomes.

The New Automatic Proofreader

```
10 VEC=PEEK(772)+256*PEEK(773)
   :LO=43:HI=44
20 PRINT "AUTOMATIC PROOFREADE
   R FOR ";:IF VEC=42364 THEN
   {SPACE}PRINT "C-64"
30 IF VEC=50556 THEN PRINT "VI
   C-20"
40 IF VEC=35158 THEN GRAPHIC C
   LR:PRINT "PLUS/4 & 16"
50 IF VEC=17165 THEN LO=45:HI=
   46:GRAPHIC CLR:PRINT"128"
60 SA=(PEEK(LO)+256*PEEK(HI))+
   6:ADR=SA
70 FOR J=0 TO 166:READ BYT:POK
   E ADR,BYT:ADR=ADR+1:CHK=CHK
   +BYT:NEXT
80 IF CHK<>20570 THEN PRINT "*
   ERROR* CHECK TYPING IN DATA
    STATEMENTS":END
90 FOR J=1 TO 5:READ RF,LF,HF:
   RS=SA+RF:HB=INT(RS/256):LB=
   RS-(256*HB)
100 CHK=CHK+RF+LF+HF:POKE SA+L
   F,LB:POKE SA+HF,HB:NEXT
110 IF CHK<>22054 THEN PRINT "
   *ERROR* RELOAD PROGRAM AND
   {SPACE}CHECK FINAL LINE":EN
   D
120 POKE SA+149,PEEK(772):POKE
    SA+150,PEEK(773)
130 IF VEC=17165 THEN POKE SA+
   14,22:POKE SA+18,23:POKESA+
   29,224:POKESA+139,224
140 PRINT CHR$(147);CHR$(17);"
   PROOFREADER ACTIVE":SYS SA
150 POKE HI,PEEK(HI)+1:POKE (P
   EEK(LO)+256*PEEK(HI))-1,0:N
   EW
160 DATA 120,169,73,141,4,3,16
   9,3,141,5,3
170 DATA 88,96,165,20,133,167,
   165,21,133,168,169
180 DATA 0,141,0,255,162,31,18
   1,199,157,227,3
190 DATA 202,16,248,169,19,32,
   210,255,169,18,32
200 DATA 210,255,160,0,132,180
   ,132,176,136,230,180
210 DATA 200,185,0,2,240,46,20
   1,34,208,8,72
220 DATA 165,176,73,255,133,17
   6,104,72,201,32,208
230 DATA 7,165,176,208,3,104,2
   08,226,104,166,180
240 DATA 24,165,167,121,0,2,13
   3,167,165,168,105
250 DATA 0,133,168,202,208,239
   ,240,202,165,167,69
260 DATA 168,72,41,15,168,185,
   211,3,32,210,255
270 DATA 104,74,74,74,74,168,1
   85,211,3,32,210
280 DATA 255,162,31,189,227,3,
   149,199,202,16,248
290 DATA 169,146,32,210,255,76
   ,86,137,65,66,67
300 DATA 68,69,70,71,72,74,75,
   77,80,81,82,83,88
310 DATA 13,2,7,167,31,32,151,
   116,117,151,128,129,167,136
   ,137
```

Best Buys From TENEX

No Gimmicks, No Hidden Charges, No Nonsense, Just Low Prices and Great Service!

FREE

Dust Cover & Everything Book

Discover the savings and easy shopping available from TENEX Computer Express PLUS receive a **FREE** dust cover for your C64, C128 or 64C! Cover is anti-static, 8-gauge vinyl sewn to our exacting standards with reinforced seams. Get to know our great products, extensive selection and fast service with a **FREE** copy of our *Everything Book for Commodore Computing*. ($2.95 Shipping Charge)

31627 C64 Dust Cover and Catalog	(G4Q)
38464 C128 Dust Cover and Catalog	(G4Q)
65180 64C Dust Cover and Catalog	(G4Q)

From microfal

The 39¢ Diskette

Are you paying too much for diskettes? Try our first quality, prime, 5-1/4" diskettes (no rejects, no seconds) at these fantastic sale prices and save, save, SAVE! Disks are packaged in boxes of 50; including diskettes in sleeves, labels, and write-protect tabs.

Each diskette is certified to be 100% error free and comes with a lifetime warranty (if you have a problem, we'll replace the diskette). All diskettes include hub reinforcement rings and write-protect notch.

All diskettes are double-density and work in either single or double-density drives.

SS, DD Diskettes, Box of 50 32391	$19.50 - 39¢ ea.!
DS, DD Diskettes, Box of 50 32403	$24.50 - 49¢ ea.!

Diskette Storage

Only $9.95

- 100 disk (5-1/4") capacity.
- Lock and keys for extra security and easy carrying.
- Includes 8 index dividers with labels for organization of filing and retrieval.
- Made of durable anti-static, high impact plastic.
- Attractive smoked color lid.

Sug. Retail $19.95

66826 **NOW ONLY $9.95**

Hardware

Printers		Interfaces	
Okidata 180 Printer	$224.95	Xetec Super Graphix Jr	$44.95
Okidata 120 Printer	$189.95	Xetec Super Graphix	$59.95
Okidata Microline 183	$279.95	Xetec Super Graphix Gold	$CALL
Okimate 20 Color Printer	$124.95	PPI Interface	$29.95
Star NX-1000	$CALL		
Star NX-1000C	$CALL	**Joysticks/Controllers**	
Star NX-1000 Rainbow	$CALL	NEW! Wico Ergostick	$19.95
Star NX-15	$CALL	Commodore 1352 Mouse	$69.95
Seikosha SP-180	$169.95	Epyx 500XJ	$15.95
Seikosha SP 1200-AI	$199.95	Cartridge Expander, C64	$19.95
Seikosha SP 1600-AI	$CALL	IconTroller	Sale $14.95
		SuncomTac 5	$14.95

Computers		Power Supplies	
Commodore C128D	$CALL	CPS-30 Power Supply, C64	$29.95
Amiga 500	$CALL	Pow'r Pak 64	$49.95
Amiga 2000	$CALL	Pow'r Pak 128	$59.95
TENEX Turbo (Loaded)	$595.00		

Disk Drives		Accessories	
FSD-2+ Disk Drive	Sale $149.00	Disk Doubler	$6.95
Excel 2001 Disk Drive	Sale $199.00	Universal Printer Stand+	$14.95
Commodore 1581Drive	$CALL	Data Transfer Switch	$24.95
Commodore 1541 Drive	$CALL		

Monitors		Ribbons	
13" Color Composite	$CALL	NX-1000 Black	$5.95
Com. 1084 RGB Color	$CALL	Okidata 120/180/183	$7.95
Magnavox CM8762, Color	$269.95	Okimate Color	$3.95
		Gemini 10X,SG-10/15	$2.99

Software

Access	
Echelon	$26.95

Berkeley	
GEOS-64	$39.95
GEOS-128	$44.95
geoPublish	$44.95
geoCalc, C128	$44.95
geoFile, C128	$44.95
Writer's Workshop-C128	$49.95
Writer's Workshop-C64	$32.95
Deskpack	$24.95

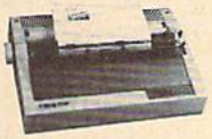
Cinemaware	
The Three Stooges	$23.95
Warpspeed	$34.95

Thunder Mountain	
Pac-Man	$7.95
Ms. Pac-Man	$7.95

Utilities	
Big Blue Reader CP/M	$34.95
Drive Alignment	$24.95
Fast Load (Epyx)	Sale $23.95
Copy II 64/128	$34.95
The Final Cartridge III	$53.95
Flexidraw 5.5	$23.95
Print Shop	$26.95

Free! 56 Page "Everything" Book With Any Order!

$89.95



True Letter-Quality Printing

The Blue Chip features bi-directional daisywheel printing with a print speed of over 150 words per minute. Its friction feed mechanism operates just like a typewriter's release lever and paper advance knob, for your use with letterhead, envelopes, etc. This printer will plug into the serial port of your Commodore. Use the included cable and you're ready to go! Includes a high-quality print ribbon that lasts for 70,000 characters. Six month warranty

77428	Blue Chip Daisywheel Printer	$89.95
77436	Black Film Ribbon for Blue Chip	$5.95
77512	Black Ribbon, Multi-strike for Blue Chip	$8.95

$74.95

1200 Baud Bargain

The VOLKS 6480 MODEM transmits at 1200 baud with the ability to slow down to 300 baud for maximum capability. This Volks Modem will connect directly to the user port of your Commodore. Its features include over 30K memory, Auto Dial/Auto Answer, Bell 212A capability, tone and pulse dialing plus more. Includes FREE Comterm IV software.

40521 Volks 6480 Modem $74.95

THE BEST PRICES
THE BEST SERVICE

WHY SHOP ANYWHERE ELSE?

Formed For The Human Hand

Only $19.95

Ergostick Joystick. This is the cutting edge of joystick technology. It's the Ergostick Joystick and you'll be amazed at its innovation. Unlike all other joysticks, the Ergostick literally forms around the human hand which optimizes the operator's hand/eye coordination.

76253 Ergostick Joystick $19.95

From Your Friends At

TENEX Computer Express

We gladly accept mail orders!
P.O. Box 6578
South Bend, IN 46660

Ad G4Q

Questions?
Call 219/259-7051

Shipping Charges

Order Amount	Charge
less than $19.99	$3.75
$20.00-$39.99	4.75
$40.00-$74.99	5.75
$75.00-$149.99	6.75
$150.00-$299.99	7.75
$300.00 & up	8.75

MasterCard · VISA

No Extra Fee For Charges!

ORDER TOLL FREE
1-800-348-2778

WE VERIFY CHARGE CARD ADDRESSES

COMMODORE 64 is a registered trademark; and COMMODORE 128 is a trademark of Commodore Electronics, Ltd. APO, FPO, AK, HI, CN, VI, GU, and foreign orders are subject to additional shipping charges. NOTE: Due to publishing lead-times, product prices and specifications are subject to change without notice.

MLX Machine Language Entry Program For Commodore 64

Ottis Cowper

"MLX" is a labor-saving utility that allows almost fail-safe entry of Commodore 64 machine language programs.

Type in and save some copies of MLX—you'll want to use it to enter future ML programs from COMPUTE!'s GAZETTE. When you're ready to enter an ML program, load and run MLX. It asks you for a starting address and an ending address. These addresses appear in the article accompanying the MLX-format program listing you're typing.

If you're unfamiliar with machine language, the addresses (and all other values you enter in MLX) may appear strange. Instead of the usual decimal numbers you're accustomed to, these numbers are in *hexadecimal*—a base 16 numbering system commonly used by ML programmers. Hexadecimal—hex for short—includes the numerals 0–9 and the letters A–F. But don't worry—even if you know nothing about ML or hex, you should have no trouble using MLX.

After you enter the starting and ending addresses, you'll be offered the option of clearing the workspace. Choose this option if you're starting to enter a new listing. If you're continuing a listing that's partially typed from a previous session, don't choose this option.

A functions menu will appear. The first option in the menu is ENTER DATA. If you're just starting to type in a program, pick this. Press the E key, and type the first number in the first line of the program listing. If you've already typed in part of a program, type the line number where you left off typing at the end of the previous session (be sure to load the partially completed program before you resume entry). In any case, make sure the address you enter corresponds to the address of a line in the listing you are entering. Otherwise, you'll be unable to enter the data correctly. If you pressed E by mistake, you can return to the command menu by pressing RETURN alone when asked for the address. (You can get back to the menu from most options by pressing RETURN with no other input.)

Entering A Listing

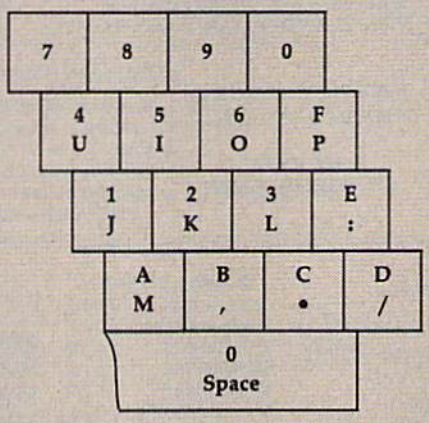
Once you're in Enter mode, MLX prints the address for each program line for you. You then type in all nine numbers on that line, beginning with the first two-digit number after the colon (:). Each line represents eight data bytes and a checksum. Although an MLX-format listing appears similar to the "hex dump" listings from a machine language monitor program, the extra checksum number on the end allows MLX to check your typing.

When you enter a line, MLX recalculates the checksum from the eight bytes and the address and compares this value to the number from the ninth column. If the values match, you'll hear a bell tone, the data will be added to the workspace area, and the prompt for the next line of data will appear. But if MLX detects a typing error, you'll hear a low buzz and see an error message. The line will then be redisplayed for editing.

Invalid Characters Banned

Only a few keys are active while you're entering data, so you may have to unlearn some habits. You *do not* type spaces between the columns; MLX automatically inserts these for you. You *do not* press RETURN after typing the last number in a line; MLX automatically enters and checks the line after you type the last digit.

Only the numerals 0–9 and the letters A–F can be typed in. If you press any other key (with some exceptions noted below), you'll hear a warning buzz. To simplify typing, the numeric keypad modification from the March 1986 "Bug-Swatter" column is now incorporated in the listing. The keypad is active only while entering data. Addresses must be entered with the normal letter and number keys. The figure below shows the keypad configuration:



MLX checks for transposed characters. If you're supposed to type in A0 and instead enter 0A, MLX will catch your mistake. There is one error that can slip past MLX: Because of the checksum formula used, MLX won't notice if you accidentally type FF in place of 00, and vice versa. And there's a very slim chance that you could garble a line and still end up with a combination of characters that adds up to the proper checksum. However, these mistakes should not occur if you take reasonable care while entering data.

Editing Features

To correct typing mistakes before finishing a line, use the INST/DEL key to delete the character to the left of the cursor. (The cursor-left key also deletes.) If you mess up a line really badly, press CLR/HOME to start the line over. The RETURN key is also active, but only before any data is typed on a line. Pressing RETURN at this point returns you to the command menu. After you type a character of data, MLX disables RETURN until the cursor returns to the start of a line. Remember, you can press CLR/HOME to quickly get to a line number prompt.

More editing features are available when correcting lines in which MLX has detected an error. To make corrections in a line that MLX has redisplayed for editing, compare the line on the screen with the one printed in the listing, then move the cursor to the mistake and type the correct key. The cursor left and right keys provide the normal cursor controls. (The INST/DEL key now works as an alternative cursor-left key.) You cannot move left beyond the first character in the line. If you try to move beyond the rightmost character, you'll reenter the line. During editing, RETURN is active; pressing it tells MLX to recheck the line. You can press the CLR/HOME key to clear the entire line if you want to start from scratch, or if you want to get to a line number prompt to use RETURN to get back to the menu.

Display Data

The second menu choice, DISPLAY DATA, examines memory and shows the contents in the same format as the program listing (including the checksum). When you press D, MLX asks you for a starting address. Be sure that the starting address you give corresponds to a line number in the listing. Otherwise, the checksum display will be meaningless. MLX displays program lines until it reaches the end of the program, at which point the menu is redis-

COMMODORE ☆AMIGA☆
CHIPS, PARTS, DIAGNOSTICS (Factory Fresh)

6510	11.55	8520	19.50
6526	12.50	901 ROMS	11.50
6581	13.85	68010	24.95
PLA/82S100	14.75	8362 (DENISE)	59.85
325302	12.95	8364 (PAULA)	59.75
325572	12.95	8386 (GARY)	16.65
LAG570	9.95	8370 (FAT AGNUS)	65.00
310654	9.95	251913	23.50

AMIGA CHIPS AND MANY OTHERS
☆Ask for Special Pricing☆

"COMMODORE DIAGNOSTICIAN"—A new invaluable tool for fixing C64/periph. Save time and money, locate faulty chips in seconds, (over 7,000 sold), $7.95.

AUTHORIZED COMMODORE REPAIR SINCE 1978.
*$54.95—Includes Parts/Labor

"NEW" Heavy Duty Power Supply for the C64—*$27.95.

KASARA MICROSYSTEMS, INC.
33 Murray Hill Drive
Spring Valley, NY 10977
(914) 356-3131
(800) 248-2983
*plus UPS

VISA MasterCard

WIN THE LOTTO
WITH YOUR HOME COMPUTER!

Use your home computer and Soft-Byte's amazing new **"Lotto Program"** to get more winning tickets.

In just seconds this software analyzes past winners and produces a powerful probability study on easy-to-read charts. With a single press of a key, you'll see trends, patterns, odds/evens, sum totals, number frequencies, and much more. It also includes automatic number wheeling, instant updating, and a built-in tutorial.

Ask your software dealer.

APPLE, IBM, and Commodore	$24.95
Atari, Radio Shack	$21.95
MacIntosh	$29.95
Back-up Copies	$3.00

Add $2.00 shipping and handling. Credit card orders approved by phone and shipped same day.

Make checks payable to **SOFT-BYTE** and mail to:

P.O. Box 556 Forest Park
Dayton, Ohio 45405

Soft-Byte
513-278-1110

VISA MasterCard

NEW! Take The Heat Off Your 64/128 Drive!

Overheating and line surges are a major cause of frustrating program malfunctions and permanent damage to your Commodore disk drive.

Now, for the first time, you can protect your investment with the COM-COOL PLUS™ Cooling Fan/Surge Protector.

1. Washable filters remove dust **before** forcing air through.
2. Quiet fan can cool two stacked disk drives.
3. Foam base holds unit firmly in place.
4. Protected outlets clip spikes at a safe 130V. Replaceable fuse.
5. Pilot lights monitor power, ground and SURGE protection.

Two models for use with Commodore 1541 or 1571 drives

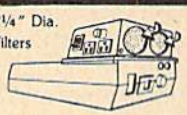
COM-COOL PLUS™ $59.95
Cooling Fan/Surge Protector

COM-COOL™ $39.95
Economical cooling unit (does not include surge suppression and line filter)

COM-COOL and COM-COOL PLUS are trademarks of AIER Products. Commodore ltd is a registered trademark of Commodore Electronics Ltd

AIER

2¼" Dia. Filters



AIER PRODUCTS
522 West Bergen
Milwaukee, WI 53217
414-277-9120

CS Distributed exclusively by:

COMPUTER SOFTWARE SERVICE • A CHAS. LEVY CIRCULATING COMPANY
2150 Executive Drive, Addison, IL 60101 • In IL call 800-331-SOFT
DEALERS ONLY CALL: 1-800-422-4912

AUTHORIZED ATARI ST/XL/XE

BUY, SELL OR TRADE!!!

COMMODORE/AMIGA DEALERS

All Hardware/Software & Accessories

Plus IBM Compatibles & Equipment

LOOK HOW MUCH YOUR C64/C128 IS WORTH $$ IN TRADE!

NEW AMIGA 500-512K RAM, 880K DRIVE $349*

NEW AMIGA 2000-1MB RAM, 880K DRIVE $1299*

NEW COMMODORE C128D (built-in 1571) $249*

NEW COMMODORE COLT TURBO $479* (100% IBM Compatible)
complete Dual 360K drives, 640K RAM, Printer/Modem/-Mouse ports, Color & Mono graphics, MS-DOS/GW BASIC.

*with trade-in of your C128 & C1571 or add $75 plus your C64 & 1541.

WANT TO TRADE-IN YOUR AMIGA? ATARI ST? $$
NEW AMIGA 2000 $1199 with trade-in of A500 or A1000-512K
NEW AMIGA 500-512K RAM, 880K DRIVE $149 with trade-in of Atari 520ST Color System.

NEW PRODUCT PRICES

— AMIGA/PC —					
Commodore PC10-III	$649	A500	$549	512K RAM EXP	$149
1010 ext drive	$199	Master 3A (100% 1010)	$185	A2000-1MB RAM	$1499
2MB RAM EXP	$425	Bridge Card w/drive	$529	20MB Drive w/cont	$579
— 64-128 —					
64C CPU w/GEOS	$159	1351 Mouse	$39	1764 256k RAM C64	$119
128D with built-in drive	$449	1700 128K RAM C128	$109	1750 512k RAM C128	$159
C1084 RGB 80	$299	C1802C 40/80 Color	$189	C1670 1200	$75
— DRIVES —					
1581 3.5" Drive	$179	1571 drive	$225	2001 (100% 1571)	$209
1541-II Drive	$179	FSD-2 drv (100% 1541)	$159	Amiga 1010 drive	$199
— PRINTERS —					
Star NX-1000,144cps	$189	Star NX-1000 Color	$249	Star NB-2415 (135 col)	$649
Okidate 183 (135 col)	$315	Micro R/D 2K Intfc	$49	Micro R/D 10K Intfc	$59
Xetec JR Intfc	$39	Xetec SR Intfc	$59	Xetec GOLD Intfc	$119
— GOODIES/POWER —					
Epxy 500XJ Joystick	$19	SpectraVideo Joytick	$6	Drive/printer cable	$9
C64 power supply	$29	C128 power supply	$59	Amiga 500+ powr spply	$99
— MODEMS —					
C1670 1200 (In Stock!)	$75	Avatex 1200hc	$99	Avatex 1200e HC	$79
Avatex 2400hc	$199	Prac.Per.2400hc	$189	SmartLink 2400hc	$189

USED PRODUCT PRICES

C64 CPU	$119	C128 CPU	$199	VIC-20 CPU	$35
1541 Drive	$125	1571 Drive	$189	Xetec LT. Kernal 20MB	$599
Vicmodem 64/128	$25	64/128 Workstation	$59	Hayes Smartmodem	$49
Digitizer/Recognition	$59	C1802 Monitor	$149	Monitors from	$39
MPS 801 Printer	$72	VIC 1525 Printer	$79	Okimate 10 color w/PIP	$99
Gemini 10 Printer	$119	Commodore 1530/C2N	$20	DSI PPI intfc	$32
Xetec Graphix SR	$50	VIC Software Roms/Tapes!!		Software/Books from	$2.00

Hundreds of software & book titles for VIC-20, C64, C128 from $1.00. Call our computer with your 300/1200 baud modem 24 hours a day for software quotes. (303) 939-8174.

We buy/sell/trade new & used Commodore/Amiga, IBM compatibles, Atari/ST including hardware, software and accessories. All references to trade-ins assume equipment to be in good working condition. Shipping/handling will be added to all prices.

CUSTOMER SATISFACTION GUARANTEED with our exclusive 10 day return/refund policy.

We will pay you $CASH$ for your equipment and accessories. Call for a price quote today. $CASH$ in on your damaged equipment too! Authorized Dealer/Service Center for Commodore/Amiga, Atari ST/XL/XE computers and accessories.

2017 13th Street, Suite A
Boulder, CO 80302

Computer Repeats, Inc.

Orders/Questions: (303) 939-8144
Modem software quotes: (303) 939-8174

We Accept Master Card/VISA/American Express and C.O.D.

Prices shown reflect a 3% discount for cash. Add 3% for credit card purchases. Prices shown are mail order only.

WE CHECK FOR CREDIT CARD THEFT!

Authorized Dealers for COMMODORE/AMIGA and ATARI ST/XL/XE Computers and Accessories.

played. You can pause the display by pressing the space bar. (MLX finishes printing the current line before halting.) Press space again to restart the display. To break out of the display and get back to the menu before the ending address is reached, press RETURN.

Other Menu Options

Two more menu selections let you save programs and load them back into the computer. These are SAVE FILE and LOAD FILE; their operation is quite straightforward. When you press S or L, MLX asks you for the filename. You'll then be asked to press either D or T to select disk or tape.

You'll notice the disk drive starting and stopping several times during a load or save. Don't panic; this is normal behavior. MLX opens and reads from or writes to the file instead of using the usual LOAD and SAVE commands. Disk users should also note that the drive prefix 0: is automatically added to the filename (line 750), so this should *not* be included when entering the name. This also precludes the use of @ for Save-with-Replace, so remember to give each version you save a different name.

Remember that MLX saves the entire workspace area from the starting address to the ending address, so the save or load may take longer than you might expect if you've entered only a small amount of data from a long listing. When saving a partially completed listing, make sure to note the address where you stopped typing so you'll know where to resume entry when you reload.

MLX reports the standard disk or tape error messages if any problems are detected during the save or load. (Tape users should bear in mind that Commodore computers are never able to detect errors during a save to tape.) MLX also has three special load error messages: INCORRECT STARTING ADDRESS, which means the file you're trying to load does not have the starting address you specified when you ran MLX; LOAD ENDED AT *address*, which means the file you're trying to load ends before the ending address you specified when you started MLX; and TRUNCATED AT ENDING ADDRESS, which means the file you're trying to load extends beyond the ending address you specified when you started MLX. If you see one of these messages and feel certain that you've loaded the right file, exit and rerun MLX, being careful to enter the correct starting and ending addresses.

The QUIT menu option has the obvious effect—it stops MLX and enters BASIC. The RUN/STOP key is disabled, so the Q option lets you exit the program without turning off the computer. (Of course, RUN/STOP-RESTORE also gets you out.) You'll be asked for verification; press Y to exit to BASIC, or any other key to return to the menu. After quitting, you can type RUN again and reenter MLX without losing your data, as long as you don't use the clear workspace option.

The Finished Product

When you've finished typing all the data for an ML program and saved your work, you're ready to see the results. The instructions for loading and using the finished product vary from program to program. Some ML programs are designed to be loaded and run like BASIC programs, so all you need to type is LOAD *"filename"*,8 for disk or LOAD *"filename"* for tape, and then RUN. Such programs will usually have a starting address of 0801 for the 64. Other programs must be reloaded to specific addresses with a command such as LOAD *"filename"*,8,1 for disk or LOAD *"filename"*,1,1 for tape, and then started with a SYS to a particular memory address. On the Commodore 64, the most common starting address for such programs is 49152, which corresponds to MLX address C000. In either case, you should always refer to the article which accompanies the ML listing for information on loading and running the program.

An Ounce Of Prevention

By the time you finish typing in the data for a long ML program, you may have several hours invested in the project. Don't take chances—use our "Automatic Proofreader" to type the new MLX, and then test your copy *thoroughly* before first using it to enter any significant amount of data. Make sure all the menu options work as they should. Enter fragments of the program starting at several different addresses, and then use the Display option to verify that the data has been entered correctly. And be sure to test the Save and Load options several times to insure that you can recall your work from disk or tape. Don't let a simple typing error in the new MLX cost you several nights of hard work.

MLX For Commodore 64

```
SS 10 REM VERSION 1.1: LINES 8
      30,950 MODIFIED, LINES 4
      85-487 ADDED
EK 100 POKE 56,50:CLR:DIM IN$,
      I,J,A,B,A$,B$,A(7),N$
DM 110 C4=48:C6=16:C7=7:Z2=2:Z
      4=254:Z5=255:Z6=256:Z7=
      127
CJ 120 FA=PEEK(45)+Z6*PEEK(46)
      :BS=PEEK(55)+Z6*PEEK(56
      ):H$="0123456789ABCDEF"
SB 130 R$=CHR$(13):L$="{LEFT}"
      :S$=" ":D$=CHR$(20):Z$=
      CHR$(0):T$="{13 RIGHT}"
CQ 140 SD=54272:FOR I=SD TO SD
      +23:POKE I,0:NEXT:POKE
      {SPACE}SD+24,15:POKE 78
      8,52
FC 150 PRINT"{CLR}"CHR$(142)CH
      R$(8):POKE 53280,15:POK
      E 53281,15
EJ 160 PRINT T$" {RED}{RVS}
      {2 SPACES}[8 @]
      {2 SPACES}"SPC(28)"
      {2 SPACES}{OFF}{BLU} ML
      X II {RED}{RVS}
      {2 SPACES}"SPC(28)"
      {12 SPACES}{BLU}"
FR 170 PRINT"{3 DOWN}
      {3 SPACES}COMPUTE!'S MA
      CHINE LANGUAGE EDITOR
      {3 DOWN}"
JB 180 PRINT"{BLK}STARTING ADD
      RESS[4]";:GOSUB300:SA=A
      D:GOSUB1040:IF F THEN18
      0
GF 190 PRINT"{BLK}{2 SPACES}EN
      DING ADDRESS[4]";:GOSUB
      300:EA=AD:GOSUB1030:IF
      {SPACE}F THEN190
KR 200 INPUT"{3 DOWN}{BLK}CLEA
      R WORKSPACE [Y/N][4]";A
      $:IF LEFT$(A$,1)<>"Y"TH
      EN220
PG 210 PRINT"{2 DOWN}{BLU}WORK
      ING...";:FORI=BS TO BS+
      EA-SA+7:POKE I,0:NEXT:P
      RINT"DONE"
DR 220 PRINTTAB(10)"{2 DOWN}
      {BLK}{RVS} MLX COMMAND
      {SPACE}MENU {DOWN}[4]":
      PRINT T$"{RVS}E{OFF}NTE
      R DATA"
BD 230 PRINT T$"{RVS}D{OFF}ISP
      LAY DATA":PRINT T$"
      {RVS}L{OFF}OAD FILE"
JS 240 PRINT T$"{RVS}S{OFF}AVE
       FILE":PRINT T$"{RVS}Q
      {OFF}UIT{2 DOWN}{BLK}"
JH 250 GET A$:IF A$=N$ THEN250
HK 260 A=0:FOR I=1 TO 5:IF A$=
      MID$("EDLSQ",I,1)THEN A
      =I:I=5
FD 270 NEXT:ON A GOTO420,610,6
      90,700,280:GOSUB1060:GO
      TO250
EJ 280 PRINT"{RVS} QUIT ":INPU
      T"{DOWN}[4]ARE YOU SURE
       [Y/N]";A$:IF LEFT$(A$,
      1)<>"Y"THEN220
EM 290 POKE SD+24,0:END
JX 300 IN$=N$:AD=0:INPUTIN$:IF
      LEN(IN$)<>4THENRETURN
KF 310 B$=IN$:GOSUB320:AD=A:B$
      =MID$(IN$,3):GOSUB320:A
      D=AD*256+A:RETURN
PP 320 A=0:FOR J=1 TO 2:A$=MID
      $(B$,J,1):B=ASC(A$)-C4+
      (A$>"@")*C7:A=A*C6+B
JA 330 IF B<0 OR B>15 THEN AD=
      0:A=-1:J=2
GX 340 NEXT:RETURN
CH 350 B=INT(A/C6):PRINT MID$(
      H$,B+1,1);:B=A-B*C6:PRI
      NT MID$(H$,B+1,1);:RETU
      RN
RR 360 A=INT(AD/Z6):GOSUB350:A
      =AD-A*Z6:GOSUB350:PRINT
      ":";
BE 370 CK=INT(AD/Z6):CK=AD-Z4*
      CK+Z5*(CK>Z7):GOTO390
PX 380 CK=CK*Z2+Z5*(CK>Z7)+A
```

```
JC 390 CK=CK+Z5*(CK>Z5):RETURN
QS 400 PRINT"{DOWN}STARTING AT
       [4]";:GOSUB300:IF IN$<>
       N$ THEN GOSUB1030:IF F
       {SPACE}THEN400
EX 410 RETURN
HD 420 PRINT"{RVS} ENTER DATA
       {SPACE}":GOSUB400:IF IN
       $=N$ THEN220
JK 430 OPEN3,3:PRINT
SK 440 POKE198,0:GOSUB360:IF F
        THEN PRINT IN$:PRINT"
       {UP}{5 RIGHT}";
GC 450 FOR I=0 TO 24 STEP 3:B$
       =S$:FOR J=1 TO 2:IF F T
       HEN B$=MID$(IN$,I+J,1)
HA 460 PRINT"{RVS}"B$L$;:IF I<
       24THEN PRINT"{OFF}";
HD 470 GET A$:IF A$=N$ THEN470
FK 480 IF(A$>"/"ANDA$<":")OR(A
       $>"@"ANDA$<"G")THEN540
GS 485 A=-(A$="M")-2*(A$=",")-
       3*(A$=".")-4*(A$="/")-5
       *(A$="J")-6*(A$="K")
FX 486 A=A-7*(A$="L")-8*(A$=":
       ")-9*(A$="U")-10*(A$="I
       ")-11*(A$="O")-12*(A$="
       P")
CM 487 A=A-13*(A$=S$):IF A THE
       N A$=MID$("ABCD123E456F
       0",A,1):GOTO 540
MP 490 IF A$=R$ AND((I=0)AND(J
       =1)OR F)THEN PRINT B$;:
       J=2:NEXT:I=24:GOTO550
KC 500 IF A$="{HOME}" THEN PRI
       NT B$:J=2:NEXT:I=24:NEX
       T:F=0:GOTO440
MX 510 IF(A$="{RIGHT}")ANDF TH
       ENPRINT B$L$;:GOTO540
GK 520 IF A$<>L$ AND A$<>D$ OR
       ((I=0)AND(J=1))THEN GOS
       UB1060:GOTO470
HG 530 A$=L$+S$+L$:PRINT B$L$;
       :J=2-J:IF J THEN PRINT
       {SPACE}L$;:I=I-3
QS 540 PRINT A$;:NEXT J:PRINT
       {SPACE}S$;
PM 550 NEXT I:PRINT:PRINT"{UP}
       {5 RIGHT}";:INPUT#3,IN$
       :IF IN$=N$ THEN CLOSE3:
       GOTO220
QC 560 FOR I=1 TO 25 STEP3:B$=
       MID$(IN$,I):GOSUB320:IF
        I<25 THEN GOSUB380:A(I
       /3)=A
PK 570 NEXT:IF A<>CK THEN GOSU
       B1060:PRINT"{BLK}{RVS}
       {SPACE}ERROR: REENTER L
       INE [4]":F=1:GOTO440
HJ 580 GOSUB1080:B=BS+AD-SA:FO
       R I=0 TO 7:POKE B+I,A(I
       ):NEXT
QQ 590 AD=AD+8:IF AD>EA THEN C
       LOSE3:PRINT"{DOWN}{BLU}
       ** END OF ENTRY **{BLK}
       {2 DOWN}":GOTO700
GQ 600 F=0:GOTO440
QA 610 PRINT"{CLR}{DOWN}{RVS}
       {SPACE}DISPLAY DATA ":G
       OSUB400:IF IN$=N$ THEN2
       20
RJ 620 PRINT"{DOWN}{BLU}PRESS:
        {RVS}SPACE{OFF} TO PAU
       SE, {RVS}RETURN{OFF} TO
        BREAK[4]{DOWN}"
KS 630 GOSUB360:B=BS+AD-SA:FOR
       I=BTO B+7:A=PEEK(I):GOS
       UB350:GOSUB380:PRINT S$
       ;
CC 640 NEXT:PRINT"{RVS}";:A=CK
       :GOSUB350:PRINT
KH 650 F=1:AD=AD+8:IF AD>EA TH
       ENPRINT"{DOWN}{BLU}** E
       ND OF DATA **":GOTO220
KC 660 GET A$:IF A$=R$ THEN GO
       SUB1080:GOTO220
EQ 670 IF A$=S$ THEN F=F+1:GOS
       UB1080
AD 680 ONFGOTO630,660,630
CM 690 PRINT"{DOWN}{BLK}{RVS} LOAD
       {SPACE}DATA ":OP=1:GOTO
       710
PC 700 PRINT"{DOWN}{RVS} SAVE
       {SPACE}FILE ":OP=0
RX 710 IN$=N$:INPUT"{DOWN}FILE
       NAME[4]";IN$:IF IN$=N$
       {SPACE}THEN220
PR 720 F=0:PRINT"{DOWN}{BLK}
       {RVS}T{OFF}APE OR {RVS}
       D{OFF}ISK: [4]";
FP 730 GET A$:IF A$="T"THEN PR
       INT"T{DOWN}":GOTO880
HQ 740 IF A$<>"D"THEN730
HH 750 PRINT"D{DOWN}":OPEN15,8
       ,15,"I0:":B=EA-SA:IN$="
       0:"+IN$:IF OP THEN810
SQ 760 OPEN 1,8,8,IN$+",P,W":G
       OSUB860:IF A THEN220
FJ 770 AH=INT(SA/256):AL=SA-(A
       H*256):PRINT#1,CHR$(AL)
       ;CHR$(AH);
PE 780 FOR I=0 TO B:PRINT#1,CH
       R$(PEEK(BS+I));:IF ST T
       HEN800
FC 790 NEXT:CLOSE1:CLOSE15:GOT
       O940
GS 800 GOSUB1060:PRINT"{DOWN}
       {BLK}ERROR DURING SAVE:
       [4]":GOSUB860:GOTO220
MA 810 OPEN 1,8,8,IN$+",P,R":G
       OSUB860:IF A THEN220
GE 820 GET#1,A$,B$:AD=ASC(A$+Z
       $)+256*ASC(B$+Z$):IF AD
       <>SA THEN F=1:GOTO850
RX 830 FOR I=0 TO B:GET#1,A$:P
       OKE BS+I,ASC(A$+Z$):IF(
       I<>B)AND ST THEN F=2:AD
       =I:I=B
FA 840 NEXT:IF ST<>64 THEN F=3
FQ 850 CLOSE1:CLOSE15:ON ABS(F
       >0)+1 GOTO960,970
SA 860 INPUT#15,A,A$:IF A THEN
        CLOSE1:CLOSE15:GOSUB10
       60:PRINT"{RVS}ERROR: "A
       $
GQ 870 RETURN
EJ 880 POKE183,PEEK(FA+2):POKE
       187,PEEK(FA+3):POKE188,
       PEEK(FA+4):IFOP=0THEN92
       0
HJ 890 SYS 63466:IF(PEEK(783)A
       ND1)THEN GOSUB1060:PRIN
       T"{DOWN}{RVS} FILE NOT
       {SPACE}FOUND ":GOTO690
CS 900 AD=PEEK(829)+256*PEEK(8
       30):IF AD<>SA THEN F=1:
       GOTO970
SC 910 A=PEEK(831)+256*PEEK(83
       2)-1:F=F-2*(A<EA)-3*(A>
       EA):AD=A-AD:GOTO930
KM 920 A=SA:B=EA+1:GOSUB1010:P
       OKE780,3:SYS 63338
JF 930 A=BS:B=BS+(EA-SA)+1:GOS
       UB1010:ON OP GOTO950:SY
       S 63591
AE 940 GOSUB1080:PRINT"{BLU}**
        SAVE COMPLETED **":GOT
       O220
XP 950 POKE147,0:SYS 63562:IF
       {SPACE}ST>0 THEN970
FR 960 GOSUB1080:PRINT"{BLU}**
        LOAD COMPLETED **":GOT
       O220
DP 970 GOSUB1060:PRINT"{BLK}
       {RVS}ERROR DURING LOAD:
       {DOWN}[4]":ON F GOSUB98
       0,990,1000:GOTO220
PP 980 PRINT"INCORRECT STARTIN
       G ADDRESS (";:GOSUB360:
       PRINT")":RETURN
GR 990 PRINT"LOAD ENDED AT ";:
       AD=SA+AD:GOSUB360:PRINT
       D$:RETURN
FD 1000 PRINT"TRUNCATED AT END
       ING ADDRESS":RETURN
RX 1010 AH=INT(A/256):AL=A-(AH
       *256):POKE193,AL:POKE1
       94,AH
FF 1020 AH=INT(B/256):AL=B-(AH
       *256):POKE174,AL:POKE1
       75,AH:RETURN
FX 1030 IF AD<SA OR AD>EA THEN
       1050
HA 1040 IF(AD>511 AND AD<40960
       )OR(AD>49151 AND AD<53
       248)THEN GOSUB1080:F=0
       :RETURN
HC 1050 GOSUB1060:PRINT"{RVS}
       {SPACE}INVALID ADDRESS
        {DOWN}{BLK}":F=1:RETU
       RN
AR 1060 POKE SD+5,31:POKE SD+6
       ,208:POKE SD,240:POKE
       {SPACE}SD+1,4:POKE SD+
       4,33
DX 1070 FOR S=1 TO 100:NEXT:GO
       TO1090
PF 1080 POKE SD+5,8:POKE SD+6,
       240:POKE SD,0:POKE SD+
       1,90:POKE SD+4,17
AC 1090 FOR S=1 TO 100:NEXT:PO
       KE SD+4,0:POKE SD,0:PO
       KE SD+1,0:RETURN
```


TWO GREAT MUSIC PROGRAMS

The EUPHONY™ series music programs play pieces up to 50 minutes long with every note shown simultaneously on the music staff and keyboard. Notes change color as they are played. Play any portion, change instruments, key and tempo to suit your taste. Select from 9 instruments or create your own with the full power of the Commodore™ sound chip. Music can be programmed to play for hours at a time. Each program comes with the acclaimed Euphony Music Collections 1-4.

EUPHONY JR. ver. 3.0 **$26.95** plus $3 shipping
4 hours of virtuoso performances, all carefully edited. Contains many complete works, including Beethoven's Waldstein and Moonlight sonatas, several Mozart sonatas, Bach's Brandenburg Concerto No. 3 and Fugue in D minor, Chopin's Fantaisie Impromptu, Handel's Messiah (with words), plus pieces by Debussey, Couperin, Albeniz; popular pieces, hymns and more. Two disk set plus manual.

EUPHONY VERSION 3.0. **$39.95** plus $3 shipping
Our powerful music processor with many new features and an expanded 4-hour music collection (same as Euphony Jr's). Create and edit long and complex pieces of music. Use dotted 32nd notes, triplets, legato/staccato, repeats, crescendos, variable tempo, etc. Accompany music with words. Full-screen editing of music code, automatic error detection and a lot more. Two disk set plus comprehensive manual.

EUPHONY+ Same as Euphony 3.0 plus prints music scores on Epson™ and Star Micronics™ printers. $44.95 plus $3 shipping.

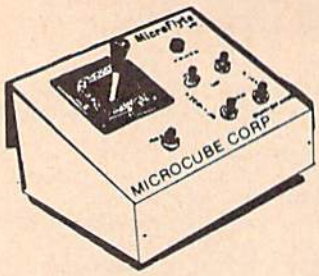
For Commodore 64 and 128 computers. All orders shipped immediately via first class mail. CODs accepted. Overseas orders please add $3.

15-DAY MONEYBACK GUARANTEE

907-479-4898

TCO SOFTWARE
P.O.Box 81504, Fairbanks, AK 99708

NOW AVAILABLE FOR THE AMIGA



The MicroFlyte JOYSTICK, the only fully proportional continuously variable joystick control for Flight Simulator II

". . .It transforms an excellent program into a truly realistic flight simulation system" B.A.C.E.

MICROCUBE PRODUCTS

Commodore 64/128
- MicroFlyte ATC Joystick **$59.95**
- Test/Calibration Disk: A diagnostic tool for your joystick **$4.95**

Amiga
- MicroFlyte Joystick—Plugs into the mouse port & works with most software . **$119.95**
- Analog Joystick **$59.95**

Include $4.00 shipping of joystick orders. FSII is a trademark of subLOGIC Corp.

Order Direct from: VISA MasterCard

MICROCUBE CORPORATION
P.O. Box 488
Leesburg, VA 22075
(703)777-7157

McConnell Software
P.O. BOX 652
Marathon, NY 13803

ATTENTION GOLFERS : If You play golf and own a C-64 or C-128 computer, your software library is incomplete without the GOLF PACKAGE.

The **GOLF PACKAGE** includes systems for computing USGA, RCGA, SSS, Callaway and 9-hole league **handicaps.**

The match player will find the **TEAM HANDICAPS** program useful.

The individual golfer can keep a record of several important areas of his game with **GOLF STATS** and use the information to improve his game.

PRICE $ 29.95

ALSO The TEACHERS GRADEBOOK:

A Comprehensive Grading system for teachers at all levels. Keeps raw grades, weights grades, calculates percent grades, statistical standard grades, and letter grades. Choose from several print options including an attendance sheet and histograms. Automatically drop low grade or merge files.

PRICE $ 29.95

To order, send your remitance to:

McConnell Software
P.O. BOX 652
Marathon, NY 13803

Can Your Computer Make

YOU $1,000,000?

WITH LOTTERY PC YOUR NEXT TICKET COULD BE WORTH MILLIONS!

LOTTERY uses the raw power and storage of your computer to determine and refine the number selection methods that will win the various lottery games you play. Don't be limited to the one or two methods that other programs use; they might not work in your state. There is no better system available!

Join the growing list of winners using our system.

SPECIFY:
Lottery 64(C64/128) • Lottery +4(Plus/4)
Lottery ST (Atari) • Lottery PC
IBM PC/XT/AT and compatibles

Commodore64/128 & Plus/4 are registered trademarks of Commodore Int
IBM PC/XT/AT are registered trademarks of International Business Machines Inc
Atari ST is a registered trademark of Atari Corp

To order, send $29.95 for each plus $3.00 postage & handling per order to
(Illinois residents add 6% sales tax)
(Orders outside North America add $3.00)

VISA

C.O.D. orders call:
(312) 566-4647

Superior Micro Systems, Inc.
P.O. Box 713 • Wheeling IL 60090

V5.0 ULTRABYTE DISK NIBBLER

NIBBLE COPIER WITH 205 PARAMETERS FOR COMMODORE 64 AND 128

- Copies most protected disks in 2 minutes without need for parameters including rapid-locked
- 205 parameters to make unprotected copies of recent programs including VMAX protection. Send stamped envelope for list
- Copies up to 40 tracks using 1 or 2 1541 or 1571 drives. Copies both sides on 1571
- Copies itself (for this reason, no refunds given)

V5.0 $29.95 PLUS $4.00 SHIPPING

Also available:

1. Disk Surgeon V2.0 -- new disk utility..... $10.00
2. Ultramail -- mail list and labels..... } both for
   Handy-Capper -- race handicapper..... } $10.00
3. McMurphy's Mansion -- text adventure.... } both for
   Soluware -- solutions to 10 adventures.... } $10.00
4. 150 older parameters and file copier..... $10.00

Add $4.00 shipping (covers up to 5 items)

Mastercard, Visa, Check or M.O., Calif. add 6.5% ($1.85) sales tax. Foreign orders/COD add $2.00. Payment must be in U.S. funds

UPDATES - Return original Ultrabyte disk with $15.00 plus $4.00 shipping. Foreign add $2.00. No exceptions.

To order, write or call 24 hr. order line. For info. write.

ULTRABYTE (818) 796-0576
P.O. Box 789 LaCanada, CA 91011 USA

FACTORY AUTHORIZED

COMMODORE REPAIR CENTER

1-800-772-7289

(312) 879-2888 IL

C64 Repair (PCB ONLY)	42.95	Amiga Repair (PCB ONLY)	99.95
C128 Repair (PCB ONLY)	64.95	Amiga Drive Repair	149.95
1541 Permanent Alignment	29.95	Printers	CALL
1541 Repair	79.95	Monitors	CALL
1571 Repair	79.95	Other Equipment	CALL

CALL BEFORE SHIPPING
PARTS AND LABOR INCLUDED
FREE RETURN SHIPPING
(APO, FPO, AIR ADD $10.00)
24-48 HR. TURNAROUND
(Subject to Parts Availability)
30 DAY WARRANTY ON ALL REPAIRS

COMMODORE PARTS

C-64 Power Supply	34.95
128 Power Supply	59.95
C-64 Over Voltage Sensor	19.95
Other Parts	CALL

(Plus $3.00 Shipping/Handling)

All parts for Commodore equipment usually in stock
For Parts Call (312) 879-2350
Dealer Discounts Available

TEKTONICS PLUS, INC.
150 HOUSTON STREET
BATAVIA, IL 60510
CLIP AND SAVE

MasterCard VISA

Classified

SOFTWARE

FREE PUBLIC DOMAIN SOFTWARE - Request free catalog or send $2 for sample disk and catalog (refundable). C64-128 CALOKE, IND., Dept. JK, Box 18477, K.C., MO 64133

COMMODORE: TRY BEFORE YOU BUY. Best selling games, utilities, educ'l + classics & new releases. 100's of titles. Visa/MC/Disc Free brochure. RENT-A-DISC, Frederick Bldg. #222, Hunt'n, WV 25701 (304) 529-3232

C64/128 FINEST PUBLIC DOMAIN PROGRAMS Pretested quality programs * Most $1.50 * * On Disk * YOU pick the programs that YOU want!!! Free diskfull of programs with first order! For a list + Description send SASE to: JLH Co, Dept. G, Box 67021, Topeka, KS 66667

C64/128 EDUCATIONAL P.D. SOFTWARE By grade level and subject, ie K–3 math, K–3 English, 4–6 math, etc. Free Catalog PSL Inc., Box 750 A, Old Bridge, NJ 08857

PUBLIC DOMAIN SOFTWARE FOR C64/128 100 programs only $10 or 260 programs for $25 or 2 stamps for catalog. MERIT, Box 114 A, Spotswood, NJ 08884

FREE SOFTWARE for C64. Send 1 stamp for Catalog. Games-Educ-Home-Business-Music Utilities. RVH Publications, 4291 Holland Road, #562-G, Virginia Beach, VA 23452

WordStar™* V2.26 For C-128 $39.95+$4.50 p/h. Public Domain Software Copying Co. 33 Gold St., Ste. L3, New York, NY 10038 *™MicroPro® **800-221-7372**

94 CENTS/DISK RENTAL for C-64, C-128, IBM, CPM. Send SASE for info (specify computer) to: PUBLIC DOMAIN USERS GROUP PO Box 1442-A12, Orange Park, FL 32067

FREE CATALOG Over 20,000 P.D. programs for C64/C128. Priced from $1.25 disk. Midwest Public Domain, POB 5048, Terre Haute, IN 47805

MEZZEPPA, WIZARD OF P.D. SOFTWARE. ONE of the largest PD libraries. Send $5 for sample-packed double-side disk of bizarre & mind blowing programs & catlg. MEZZEPPA, POB 421212, Del Rio, TX 78842

C-NET BULLETIN BOARD FOR THE 64 & 128. The most widely used and respected BBS available. 300/1200/2400 BPS, 1000 accounts, 49 message/file transfer SIGS, X-modem, Punter, a FAST ML EDITOR, on-line games, AND MUCH MORE!

SOFTECH COMPUTER SYSTEMS, INC. POST OFFICE BOX 23397 LEXINGTON, KY 40523
(606)/268-BAUD (TECH SUPPORT)
(800)/992-SCSI (ORDERS ONLY)
New Comm SFD 1001 1 Meg Floppies $169.95
VISA/MasterCard/COD WELCOME

RENT 64/128 SOFTWARE! 100's of disks. Lowest prices. No deposit or fee. Free catalog. Centsible Software, PO Box 930, St. Joseph, MI 49085 (616) 982-0327.

FREE SOFTWARE!!! All IBMpcs, Apples, Macs, TRS80s, TI99, C'dores, Adam, Timexes. Send Stamps! EXRAEXRA, Bx 5222, San Diego, CA 92105

WIN LOTTO MILLIONS! LOTTO PICKER PLUS v2.1 Lotto Picker Plus, the original lottery selection software, allows you to store winning Lotto, Keno, & Pick 3/4 numbers & choose between three modes of probability analysis (hot, due, unbiased) in order to give you the winning edge! Guaranteed to work for all lotteries. Bonus numbers are easily handled and our full-featured database editor gives you access to your files. We give you the PICKS—not a bunch of jumbled statistics! **$34.95** (+5.55 s/h). 64/128, IBM, 64K Apple II. NY res. add tax. NOT Copy-protected.
ORDER TODAY! 1-800-634-5463 ext 293 (M–F 8–5)
GE RIDGE SERVICES, INC., 170 Broadway Suite 201-CG, New York, NY 10038 Info/Dealers 718-317-1961

Games, animation, educational, business personal, utilital, music, sound software. Not pub. dom. 4 disks Only $25.00 + $2 s&h James Ianni, 418 65th St., Phila, PA 19151

SEVEN DAYS: By CROSS SOFTWARE. Watch as the biblical account of creation comes alive with sound & graphics. For the C64 Send CK or M/O for $5.65 Cal res add 6% sales tax. CROSS SOFTWARE, 13456 Gilbert St. N. Edwards, CA 93523 ph: 619-769-4289

C64 REAL MATRIX PROCESSOR SYSTEM (IMP-M) BASIC Callable ML Operations. 5" Disk + 150p User's Guide, $44 Ck, MO, MC, Visa. Send SASE for IMP-M Features List. CALI-MARD, 3650 W. College Ave, State College, PA 16801

FILE 128 $29.95 *Fast C-128 80 column Database Manager Version 2.0 with Graphics.*
TREK 128 $19.95 *The ultimate space strategy game. 80 col. graphics and sound.*
BYTE POWER
NEW! 128 PUBLIC $3/disk DOMAIN *Send for a catalog. ONE FREE with FILE or TREK 128 purchase.*
Mail check or M.O. + $2 handling to: P.O. Box 80546, San Diego, CA 92138-0546. *Specify 1541 or 1581*

HARDWARE

COMMODORE/AMIGA CHIPS, PARTS, RAM EXPANSION. Low cost service...See our display ad in this issue...Kasara Microsystems, Inc. 1-800-248-2983.

New! SPEECH THING™
For all PCs, compatibles, laptops

$69.95 **CLEAR, CLEAN, DIGITIZED SPEECH & MUSIC, UNLIMITED TEXT-TO-SPEECH**
Attaches outside the computer.

Now get popular speech technologies in ONE product! Speech Thing is a full-featured 8 bit D/A sound converter. Easily attaches outside the computer–no slots required. Software includes prerecorded speech vocabularies, synthetic text to speech (speaks any ASCII text), demo programs, and complete editing features. Price only $69.95. Also available: Voice Master PC plug in board for digital recording, editing, and VOICE RECOGNITION. (Requires Speech Thing for sound output.) Only $79.95. Patented price/performance breakthroughs!

TO ORDER BY MAIL include $4 shipping & handling ($6 Canada, $12 overseas) per order. Visa, MasterCard phone orders accepted. 30 day money back guarantee, one year warranty. Other voice I/O systems available for Apple, Commodore, and Atari computers.

Call or write today for FREE Product Catalog
COVOX INC. (503) 342-1271
675 Conger St., Eugene, Oregon 97402

pH, mVOLT, TEMP. METER for C-64, plugs into gameport. 1.5 to −1.5 V RANGE; 0.5 mV, ±0.01 pH, resolution. Data Logging BNC connector. $95. pH probe is an extra $45. SLO-TECH, Box 425 St. Clairsville, OH 43950

TEMPERATURE PROBE FOR C128/64. Suitable for in-outdoor use w/program on disk in native modes. Send $14.95 to: TEMP, PO Box 1553, Brevard, NC 28712

COMPUTER REPAIR

Now Commodore Qualified Repairs! C64:$45, 1541:$50, SX64:$65, C128:$50, 1571:$55. Buy Sell Trade New/Used - Fast Service! 30 day wnty! Mom & Pop's Computer Shop, RR2, Box 119, Cainsville, MO 64632 (816) 872-6311

COMPUTE!'s Gazette Classified is a low-cost way to tell over 225,000 microcomputer owners about your product or service.

Rates: $25 per line, minimum of four lines. Any or all of the first line set in capital letters at no charge. Add $15 per line for boldface words, or $50 for the entire ad set in boldface (any number of lines.) Inquire about display rates.
Terms: Prepayment is required. Check, money order, American Express, Visa, or MasterCard is accepted. Make checks payable to COMPUTE! Publications.
Form: Ads are subject to publisher's approval and must be either typed or legibly printed. One line equals 40 letters and spaces between words. Please underline words to be set in boldface.
General Information: Advertisers using post office box numbers in their ads must supply permanent address and telephone numbers. Orders will not be acknowledged. Ad will appear in next available issue after receipt.
Closing: 3rd of the third month preceding cover date (e.g., June issue closes March 3rd). Send order and remittance to: Kathleen Ingram, Classified Manager, COMPUTE!'s Gazette, P.O. Box 5406, Greensboro, NC 27403. To place an ad by phone, call Kathleen Ingram at (919) 275-9809.
Notice: COMPUTE! Publications cannot be responsible for offers or claims of advertisers, but will attempt to screen out misleading or questionable copy.

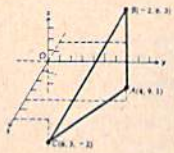
3 TECHNICAL PROGRAMS

Linear Programmer

Maximize: $Z = 2X_1 + X_2$

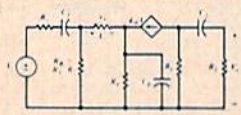
Subject to: $3X_1 + X_2 < 44$; $X_2 < 10$; $X_1 + X_2 < 18$; $2X_1 + 5X_2 < 60$

Solves linear programming problems of up to 50 variables and 35 constraints. Systems may be restricted by constraints of *equality, less than or greater than*, (different types may appear in the same problem). Objective (Z function) may be maximized or minimized. Computer displays solution (in example at left, Z=31, X_1=13, X_2=5). Initial and final tableaus. Special command for easy entry of sparse constraints.



Analytical Geometry in 3 Dimensions

Solves numerical geometry problems like those found in college level analytical geometry text books. After entering points, lines, planes and vectors, users may then calculate. Vector cross, dot, triple and scaler products. A×B, A•B, A×B•C, sA; find the angle between 2 lines, vectors or planes; find intersection of 3 planes, 2 planes, line and a plane; find a plane through 3 points, a point and a line, point and normal point and parallel plane, or perform 18 other geometric calculations. Entries made and answers displayed in users choice of several methods, including symetric equation, parametric equation, multiple points, direction and magnitude. (NOT A GRAPHICS PROGRAM)



Electronics: AC DC Circuit Analysis Programs

Program computes general numeric solution to electronic circuit of up to 40 nodes and 63 branches. Branches may contain resistors, capacitors, inductors, current sources, voltage sources or 4 types of controlled sources. Computer displays node voltages, branch voltages, currents, powers and power factors. Step function of branch parameters or frequency with graphic display of results. Menu controlled and user friendly.

Linear programming System (64/128)	$24.95
Analytical Geometry in 3 Dimensions (64/128)	$24.95
Electronics AC DC Circuit Analysis (64/128)	$29.95
Electronics AC DC Circuit Analysis (IBM PC)	$29.95

COMPUTER HEROES
P.O. Box 79 Dept. 221
Farmington, CT 06034
Orders Only 1-800-622-4070

DUST COVERS

SATISFACTION GUARANTEED

★ CUSTOM MADE TO FIT
★ HEAVY 32-oz. VINYL ANTI-STATIC
★ EXTENDS EQUIPMENT LIFE
★ Choice of Colors Light Tan or Brown

COMPUTERS		PRINTERS	
C-64/Plus 4/C-64C	8.00	Seikosha SP-1000	13.00
C-128	13.00	Comrex 220	13.00
Datassette (C2N)	5.00	C'Itoh 8510	13.00
Amiga 1000	13.00	Juki 5510	13.00
(W/Amiga Mon. Stacked)	28.00	Imagewriter	13.00
Keyboard only	7.00	Epson JX 80	13.00
Atari 800XL, 130XE	10.00	Epson FX 85/185	13.00
Atari 520 ST	14.00	Okidata 92	13.00
IBM PC/XT	28.00	Citizen MSP 10	13.00
IBM 5051 Keyboard	8.00	C/DPS 1101	16.00
(Dimensions Required for IBM Clones)		Gemini 10 & Star 10's	13.00
		Gemini 15 & Star 15's	16.00
DISK DRIVES		Atari 1027	13.00
C-1541, C-1571	8.00	MONITORS	
Amiga 3½" D/Drv	8.00	Atari SC 1224RGB	19.00
Amiga 5¼" D/Drv	9.00	C-1702, BMC Color	16.00
Indust GT, MSD SD-1	8.00	C-1902/Amiga	19.00
MSD SD-2	10.00	Amdek 500-700	19.00
Enhancer 2000	8.00	CM-141 (C-1802)	19.00
FSD-1	8.00	C-1902A/Magnvx 40	19.00
Atari 1050	8.00	NEC (State Model)	19.00
PRINTERS		Magnavox 80 RGB	19.00
C-1525/MPS 801	10.00	Princeton (State Model	19.00
C-1526/MPS 802	13.00	Thompson CM 365-66	19.00
C-MPS/803, C-1520	8.00	Taxan (State Model)	19.00
Panasonic 1090/91	13.00	Sakata SC-100	19.00
Okidata 120/192	13.00	Zenith (State Model)	19.00
Okimate 10/20	8.00	VIDEO RECORDERS	13.00
Epson MX/FX/RX80	13.00	State Make & Model Dimensions required including clock cut-out	
Epson LX80/C-1000	13.00		

Order by stating MAKE, MODEL and COLOR CHOICE - TAN or BROWN with check or money order plus $1.50 per item ($4.50 max.) shipping and handling Calif. Res. Include 6½ + local tax. APO, 2.00/item, Foreign 3.00/item

SPECIAL COVERS WILL BE MADE TO YOUR DIMENSIONS. SEND YOUR REQUIREMENTS FOR OUR LOW PRICE QUOTES.

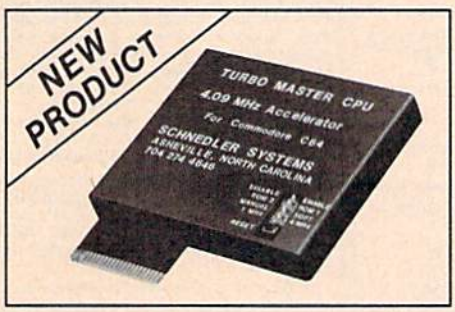
Crown Custom Covers
24621 PAIGE CIRCLE DEPT. A
LAGUNA HILLS, CA 92653
(714) 472-6362

ADVERTISERS INDEX

Reader Service Number/Advertiser	Page
102 Abacus	31
103 Aier Products	95
104 Aprotek	32
105 Berkeley Softworks	8-9
106 BRIWALL/Free Spirit Software	23
107 Busy Bee Software	67
108 CAPCOM	11
109 Cardinal Software	55
110 Central Point Software	34
C.O.M.B. Authorized Liquidator	53
111 ComputAbility	91
112 Computer Direct	79
113 Computer Heroes	100
114 Computer Repeats	95
Crown Custom Covers	100
115 Data East	IBC
116 Datel Computers	40-41
117 Electronic Arts	5
118 Fearn & Music	68
119 Kasara Microsystems, Inc.	95
120 Lyco Computer	48-52
121 Marathon Software	43
122 McConnell Software	98
123 Melbourne House	BC
124 Mibro Company	85
125 Micro Computer Services	88-89
126 Microcube Corporation	98
127 MicroProse	2
128 Montgomery Grant	83
NRI Schools	33
129 Precision Data Products	58
130 Q-Link	7
131 Renco Computer Printer Supplies	32
Schnedler Systems	100
132 Soft-Byte	95
133 Software Discounters of America	74-75
Software Support International	36
Software Support International	80-81
134 subLOGIC	29
135 Superior Micro Systems, Inc.	98
136 Taito	IFC-1
TCO Software	97
Tektonics Plus, Inc.	98
137 Tenex Computer Express	93
138 TEVEX	25
139 Tussey Computer Products	18-19
140 Ultrabyte	98
141 Utilities Unlimited, Inc.	27
142 Xetec	35

ABC's Personal Publishing	10
Classified Ads	99
COMPUTE!'s Amiga Games Disk	24
COMPUTE!'s Gazette Disk Subscription	17

COMPLETE SPEED-UP SOLUTION FOR YOUR C64!



TURBO MASTER CPU™

4.09 MHz Accelerator Cartridge for C64

- Four times faster processing speed combined with five times faster disk Load and Save.
- Easy-to-use cartridge simply plugs in.
- Software actually *runs* four times as fast. Basic, wordprocessor scrolling, other productivity, assemblers, graphics, GEOS, etc. Compatible with most software.
- On-board 65C02 microprocessor, 64K RAM, 32K EPROM.
- Introductory price only $179 including shipping in USA. Visa and Mastercard accepted.

SCHNEDLER SYSTEMS
25 Eastwood Road, Dept. G9, P.O. Box 5964
Asheville, NC 28813
Information/Telephone Orders (704) 274-4646

Dealer inquires invited.

POWERFUL LOW COST CONTROL

Data acquisition and control interfaces. C64 & C128

80-Line Simplified Digital I/O Board. 40 TTL input lines. 40 high current switched output lines. ROM cartridge socket. Order model SS100 Plus, $129. Additional boards $119.

Original Ultimate Interface. Dual 6522 VIA Board. Four 8-bit ports with handshake, timers, IRQ, etc. Expandable. Order Model 64IF22, $169. Additional boards $149.

A/D Conversion Module, 16 channels, 8-bits, requires above. Order Model 64IF/ADC0816. $69.

Manuals on above available seperately for examination. Call or write for detailed brochure.

★ ★ ★ ★ ★ ★

SERIOUS ABOUT PROGRAMMING?

Symbol Master Multi-Pass Symbolic Dissembler. Learn to program like the experts! For both C64 and native C128. "... unmatched by simpler monitor disassemblers... a real gold mine for the experienced ML programmer," *Computer Shopper*, April '87. $49.95.

PTD 6510 Symbolic Debugger. An extremely powerful tool with capabilities far beyond a machine language monitor. For C64, $49.95

MAE64 Assembler. Fully Professional 6502/65C02 macro editor assembler $29.95

C64 Source Code Book. Most complete available reconstructed and commented assembly language source code listing for Basic and Kernal ROMS. $29.95.

SCHNEDLER SYSTEMS
25 Eastwood Rd., Dept. G9, P.O. Box 5964
Asheville, NC 28813
Information/Telephone Orders (704) 274-4646

All prices include shipping prepaid USA

THE NAME OF THE GAME IS SURVIVAL.

PLATOON™

In Vietnam, an American soldier soon learned that there were no winners in this deadly game. To survive each mission with his morale and sanity intact, and return to base safely, was all he could hope for. This was captured in the award-winning film, Platoon.

In Data East's Platoon, you will experience the full impact of the film as you lead your platoon into the jungles, villages, bunkers, foxholes, and underground tunnels of war-torn Southeast Asia.

There you will encounter guerilla fighters, snipers, booby-trapped trip wires, armed patrols, and napalm air strikes. You must pick up food, medical supplies, and ammunition along the way.

At times, the odds may seem insurmountable. But don't think about winning – to survive is enough.

FOR COMMODORE 64/128™ AND AMIGA,™ ATARI® ST, APPLE II SERIES,® AND IBM.®

DATA EAST

DATA EAST USA, INC.

470 NEEDLES DR., SAN JOSE, CA 95112. (408) 286-7074.

LICENSED BY

ocean®

GAME DESIGN © 1987 OCEAN SOFTWARE LTD. PLATOON: TM & © 1986 HEMDALE FILM CORP. ALL RIGHTS RESERVED. COMMODORE, APPLE, ATARI, IBM, AND OCEAN ARE REGISTERED TRADEMARKS OF COMMODORE ELECTRONICS LTD., APPLE COMPUTERS, INC., ATARI CORP., IBM CORP., AND OCEAN SOFTWARE LTD., RESPECTIVELY.

John Elway's QUARTERBACK

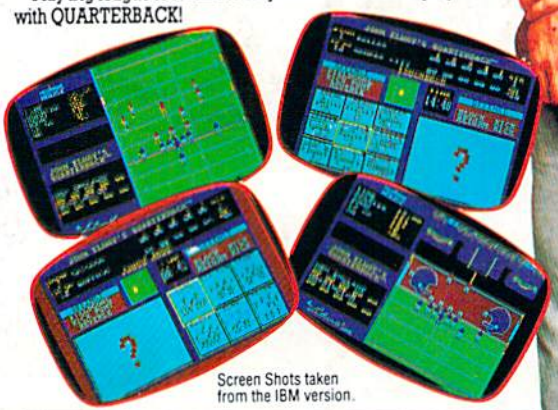
FOOTBALL THE WAY IT WAS MEANT TO BE PLAYED.

Third and ten on your own 30 yard line. Forty-three seconds left on the clock and you're down by two points. Suddenly the end zone seems to be a hundred miles away. If you're going to be a hero, now's the time. You call the play:

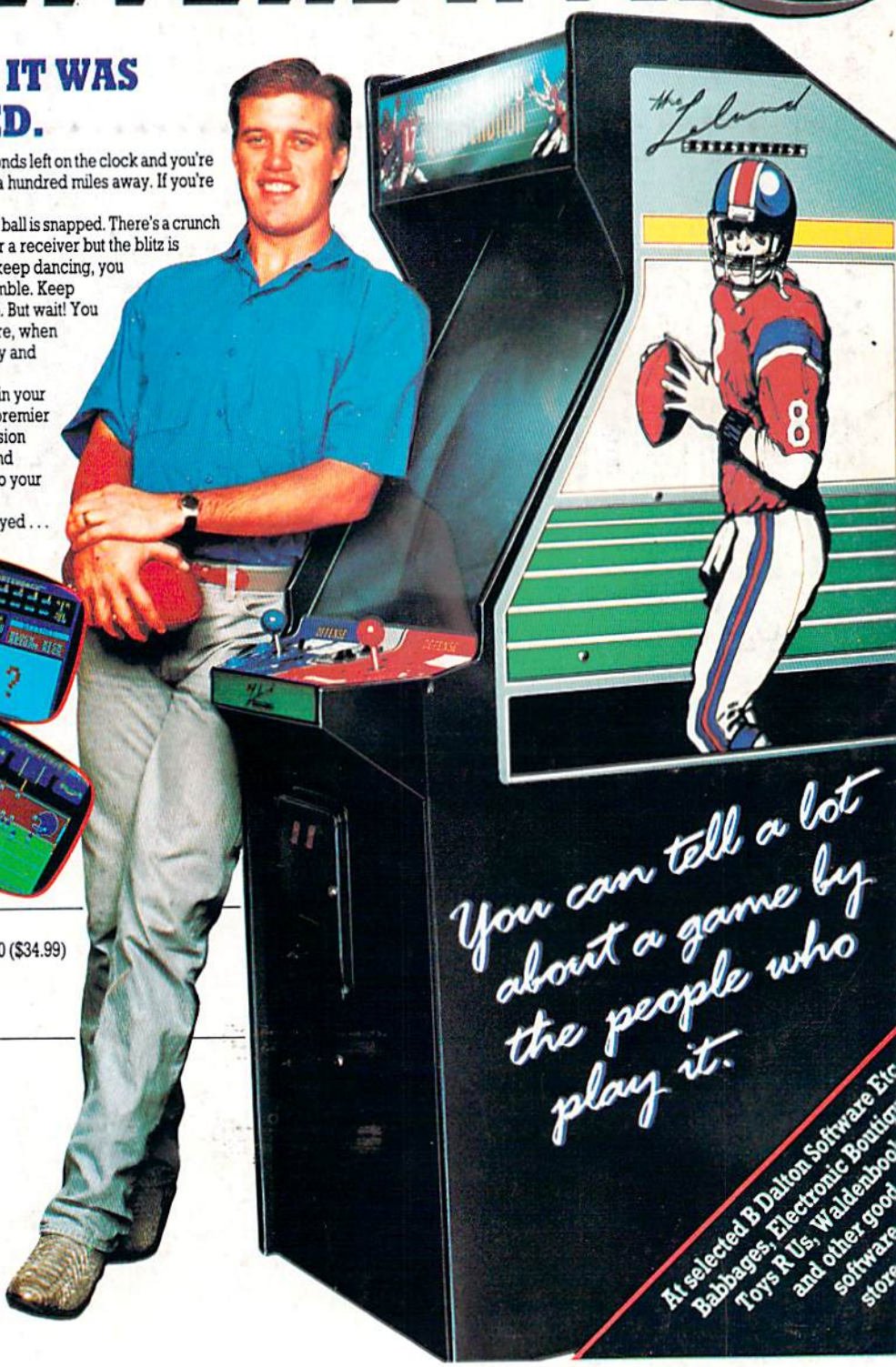
"Yellow-nineteen! Yellow-nineteen! Hut! Hut!! HUT!!!" The ball is snapped. There's a crunch of armor on the front line and you drop back. You look for a receiver but the blitz is on in a power sweep from the left! Roll to the right – you keep dancing, you look for an opening but your blockers are starting to crumble. Keep pedalling back . . . you're in trouble now, you're too deep. But wait! You spot an open man down field! You cock back, ready to fire, when suddenly an ugly-looking guard is all over you. Do you try and throw? Or duck and run!

Football action so real you can almost feel the pigskin in your hands. Designed under the watchful eyes of the game's premier quarterback – **John Elway** – this faithful computer version of the #1 arcade winner brings all the strategy and ground pounding excitement of the world's greatest sport right to your computer screen, one or two players!

Play big league football the way it was meant to be played . . . with QUARTERBACK!



Screen Shots taken from the IBM version.


You can tell a lot about a game by the people who play it.
At selected B Dalton Software Etc
Babbages, Electronic Boutiq
Toys R Us, Waldenbook
and other good
software
store

AT A SOFTWARE STORE NEAR YOU

Now Shipping for:	IBM PC and PS/2 and Tandy 1000 ($34.99)
	Commodore 64/128 ($29.99)
In Fall '88 for:	Apple II series ($34.99)
	Apple IIGS ($34.99)

MELBOURNE HOUSE

QUARTERBACK™ is a trademark of the Leland Corp., licensed from Tradewest.

Melbourne House, 711 West 17th Street, Unit G9, Costa Mesa, CA 92627. Tel. (714) 631-1001